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TRANSACTIONS

OF THE

National Dental Association

AT THE

SIXTH ANNUAL SESSION

HELD AT

NIAGARA FALLS, N. Y.

July 28-31, 1902.

DENTAL DIGEST.
J. N. CROUSE, D.D.S., PUBLISHER.
CHICAGO.
1903.

NCV141
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MAR 23 1909

ANNUAL ADDRESS.

By J. A. LIBBEY, President.

There have been various attempts to mark by some distinguishing title the character of our age. Its tremendous commercial and manufacturing energy; its wonderful discoveries, especially along the line of electricity—the brilliant adaptation of this force to practical life—have seemed appropriately to designate the age. But we are proud to be able to choose a still stronger designation, and call it the age of remarkable increasing benevolence. The gifts in behalf of education, amounting each year to many millions, have become to us a commonplace subject of felicitation; while they excite the wonder and are beginning to stimulate the same spirit in other people. But it may be well for us to ask ourselves whether it is not part of our responsibility to direct somewhat the current of this noble giving, so that some of its power and blessings shall flow into our work. We sympathize with every effort to develop universities and the opportunities for technical and manual training; we rejoice in all that instructs brain and hand; but we shall rightly ask for a place, remembering how greatly our profession needs increased facilities and the advantage of these opportunities to hasten a progress greater than that of the past. Ministering as it does to the health and happiness of the community, our profession has an unselfish platform from which to appeal for our share in these generous gifts. If we are to fully develop our science; if we are to train students who will make fresh discoveries and increase in skill—who will be able to give to suffering

thousands the results of a science completely mastered we must have a more perfect education.

The proposed lengthening of the course of study is a move in evidence of our desire to send out more skilful practitioners and unite our larger skill to the great needs of suffering humanity. I allude particularly to the National University, the Polytechnic School of Pittsburg, the prospects of enlarged university facilities, and the Evans' fund. I recommend that a committee be appointed to look after the interests of our profession in this matter. The New York State Dental Society has taken the initiative step and this Association should give all the assistance it can. It seems to me it would be better to do this work in the name of the National Dental Association, giving the New York Society due credit and a representation on the committee.

The National Dental Association is a delegate body representing the organized dental profession of this nation, and being a delegate body, its work is for the benefit of the whole organized body of dentists. Its membership is not merely the few who come as delegates and bear the burden of the work and expense, but every member of a state or local society which is represented by a delegate is in the same relation to this Association as every citizen is to our government. A citizen is a supporter of the government—this country is governed by representatives elected by the people, and the same rule should prevail in this Association. Our work is for the advancement of the whole profession and should be supported by it, instead of the burden falling exclusively upon those who devote their time, energy and talents to the work. It is the duty of every society represented in the National Dental Association to acknowledge its allegiance to it by contributing to its support. If every society would pay the small tax of one dollar for every delegate to whom it is entitled, it would increase the fund in the treasury to such an extent that this Association could accomplish vastly more than is possible under the present plans. We could encourage investigation to a greater extent, we could print our own journal, and place it in the hands of the members immediately, all the journals having the same opportunity of using any of the material they wish, instead of making a privileged journal, and having transactions come to the members as evidence of something that has gone before. As the permanent mem-

bership increases it is losing its identity as a delegate body and assuming an individuality—merely a society—and as such its influence with the organized profession will decrease. Let us maintain the representative character so ably advocated by Dr. Black in his address last year.

Legislation. One more state, Ohio, has by an act of legislature joined the ranks of those requiring examination for license. I regret they were unable to place the nominative or selective power with the state society (as no one is as competent to select examiners to conduct a professional examination as members of that profession who take an active interest therein); also, the placing of examination papers on file in the State Department. The discretionary feature is a good one if it is so guarded that abuse of that power cannot result.

In Pennsylvania the five schools and the state board of examiners have always worked in harmony. Since the establishment of the law of 1897, requiring examinations of all in possession of a diploma, and desiring a license to practice in the state, they are working together to improve the conditions from an educational standpoint, and the results have been a marked improvement in the personnel of the students, as well as in their training in the different branches. Quite a rivalry seems to exist among the schools to have their students make the best average in the examinations, and with this spirit extant good results must necessarily follow. All possible safeguards must be adopted to secure perfect fairness in examinations, if such commendable rivalry is to be maintained, instead of competition on lower planes.

The state supervision of dental education and the licensing of practitioners in Pennsylvania are greatly safeguarded through the work of the Dental Council, a body composed of the State Superintendent of Public Instruction, the President of the State Board of Health, the Secretary of Internal Affairs, and the President, for the time being, of the Pennsylvania State Dental Society. The Council passes upon the credentials of the applicant, including the matriculation requirements which have been recorded by the Superintendent of Public Instruction. A card of admission to the examinations is then given to the applicant to present to the board. As soon as the examination is completed a report of the marks on individual branches and the general average, signed by each member of the board, is sent to the

Secretary of Internal Affairs, who is also secretary of the Council, and placed on file for five years, subject to public inspection the same as any conveyance of land.

The members of the examining board are nominated by the state society, two for each vacancy, and from these names the Governor shall appoint the required number. They must be members of the state society (which is a representative body of the dental profession of the state), in good standing and have had ten years' practice. There is no act of the board which is not by law open for public inspection. In addition, the State Department issues a report of the work of the board, including the name of the applicant and college, and the marks on each division with the general average. All the questions are likewise submitted, but in case of failure the name of the applicant is withheld.

The licenses are issued by the Council, signed by its President, the Superintendent of Public Instruction, the Secretary of Internal Affairs, and by each member of the Board of Examiners; therefore the examiners are a part of the educational system, and not, as frequently alluded to, a committee for enforcement of law. If all the states would adopt a law similar to this there would be no occasion for the criminal charges brought against a member of a state board last year.

I have taken the liberty to call your attention to the Pennsylvania law because its enactment was the culmination of ripe consideration of the principles which the dental profession of that state felt should govern our standards of education. Five years' experience in its practical operation has demonstrated that it is founded in equity to all concerned; hence it has been productive of a better class of licenses by eliminating the unfit, and has enlisted the harmonious and cordial support of the teaching institutions of the state.

Recent Publications. We have among recent publications, "Answers to Questions Prescribed by Dental State Boards," by Robert B. Ludy, M. D., Philadelphia, Conover Publishing House. The first sentence of the preface is, "To pass creditable examinations is the laudable ambition of every earnest student. Many persons having an adequate knowledge of the subject in which they are tested fail because of their inability to interpret properly the intents and purposes of the questions to be answered by them." The July *Cosmos* in its bibliographical department expresses my views so clearly that I

refer you to it instead of quoting it. The function of the state board is to discover the student's general knowledge of the subject, which it cannot do in an answer of one, two or three sentences. The students who depend on this cramming process will not make high averages. I believe it is our duty to express our views as stated in the article to which I refer, "That we are firmly opposed to the idea which prompts the publication of a work of this character, for the reason that we do not believe it to be subservient to any legitimate educational end."

Honorary Degrees. The New York legislature, in a bill signed March 28, 1901, gave to the Board of Regents authority to exchange the M.D.S. degree for the D.D.S. degree, the former (M.D.S.) being strictly a local degree conferred by the Dental Society of the State of New York, and the said Board of Regents at its annual meeting, July 1, 1901, declined to exercise the power conferred by the act quoted and referred the subject to the Dental Society of the State of New York for a definite report on the matter. The National Association of Dental Faculties at its meeting last year tendered a vote of thanks to the Board of Regents for its action, accompanied by a protest against any attempt to confer honorary degrees. At the last meeting of the Dental Society of the State of New York the act of assembly conferring this questionable power upon the Regents was approved by a large majority. Standing Resolution No. 6 of this Association, which is in force at this time, is as follows—"*Resolved,* That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice." It would seem to be the duty of this Association, representing the organized dental profession of the nation, to give an expression of opinion upon this matter.

Dental Surgeons' Corps, U. S. A. The Surgeon General of the Army, in answer to my request, informed me that he had made application to the War Department that Dental Surgeon John Hess of West Point (one of the Examiners of the Army Dental Corps) be detailed to attend this meeting as its representative. I suggest that he be requested to give us some information as to what is being accomplished by the Corps. I have received letters from different members of the Corps, giving in detail their method of procedure in

examinations, operations, etc., as well as the amount of work accomplished; all of which shows the wisdom of the Department in establishing a Dental Corps in the Army.

The Committee on Army and Navy Legislation have been engaged in active work with the view of establishing a commissioned Dental Surgeons' Corps in the Navy, and making the Army Corps a commissioned instead of a contract Corps. While they have not met with the success hoped for, they are sanguine of success in the near future, the question of rank being the principal stumbling block. This Committee should be continued and instructed as to the rank for which they should contend.

The relation of dentistry to the defensive arm of the National Government is in reality but one aspect of that still broader problem of the relation of our profession to the public health. The subject is as yet in its infancy, notwithstanding the fact that much thought and labor have been expended upon it, especially in a few European countries. Our rate of progress in this department of our profession is at present comparatively slow, mainly because of the lack of a ripened public sentiment necessary to the support of our efforts in that direction. That sentiment must be created, and it would seem that the intention of the thoughtful public could be best directed to the matter by an authoritative presentation of the existing need of intelligent dental care as a health measure. Such presentation to be effective must be based upon an exhibit of the conditions which result from the impairment of the teeth and diseases of the oral cavity due to ignorance and neglect, and this Association should take such steps as it may deem wise and effective to secure statistical data upon which may be based conclusions worthy of general dissemination, with a view to not only correcting existing evils, but of demonstrating the vital importance of our ministrations to the public health.

The International Dental Federation. The International Dental Federation and International Commission of Dental Education will convene at Stockholm on August 12. The questions to be discussed by the International Commission of Dental Education as published by its officers are—1. What preliminary knowledge is necessary for the dental student? 2. What part of the medical and scientific subjects should be taken up, and at what time of the period of training should the study of them be pursued? 3. What is the importance of the

theoretical technical knowledge? 4. What is the importance of the practical technical knowledge? 5. What are the most appropriate names for the several titles now used throughout the world? The Federation will consider these essential points in aiming to establish a harmonious educational system throughout the countries of the world.

The purposes and aims of the International Dental Federation have become sufficiently familiar to the dental profession of the world through the publication of its proceedings in our periodical literature during the past year. It is therefore unnecessary for me to refer in detail to the work of that organization. I deem it, however, to be my duty as well as my pleasure to speak in terms of high commendation of the purposes of the organization, and the spirit of international fraternalism of which it is the exponent. The progress of civilization which has placed at our command the means of annihilating time and space has in the same degree brought the nations of the earth into closer relationship, and the proximity has tended to remove suspicion and antagonism as it has engendered mutual regard and respect.

The world's profession of dentistry has not escaped this civilizing influence, and the International Dental Federation is the crystallization of an effort to unify and harmonize the best elements of dentistry among all the nations of the earth upon a higher plane of endeavor, to the end that our effort toward the betterment of our profession and of humanity may be enhanced. I would therefore recommend that our delegates appointed to represent this Association at the Stockholm meeting be instructed to convey the greetings and the assurances of the sympathetic cooperation of the American dental profession to the International Dental Federation in its noble work.

Forty-three years ago the preliminary meeting for organizing a National Association was held in this place. How well that work was done has been demonstrated by the progress that has been made along all the lines of our profession. Few of the organizers are left, but their work will go on and they will live in our professional history as those who planted that their children might reap. They sowed the seed, we are reaping the harvest. Let us always keep alive the same professional spirit, cultivating the soil in which they labored, so that those who come after us may enjoy the larger fruits of our endeavor.

SECTION V.

Anatomy, Pathology and Surgery.

A Bird's-Eye View of Pathology.

PAPER BY D. R. STUBBLEFIELD, OF THE SECTION.

When the request for a "touch of your quality on Pathology" was first received it temporarily blinded me to the responsibility of its acceptance, but when the acceptance had burned the bridges behind me the pleasure died out and the responsibility seemed to take on new life. The conviction, however, that the whole must forever be greater than any part, though at the same time necessarily restricted to the sum of the parts, gave me the courage to hope that a contribution might fill some place without which even this annual session would not be complete. The professionally patriotic duty is upon every member to respond to the call of the sponsors for each section of this great national body and to do his best to meet the demand made upon him. Another reason for the faith that's in me is found in the statement contained in a letter received recently from the president of a state association. It is, "I select the other subject because I believe a paper on Pathology is usually one fool trying to teach a lot of other fools what he doesn't know himself and what they can never hope to understand." If such a sentiment can honestly exist in the mind of a typical member of the profession, there should be no apology necessary for any attempt to render more

simple what is so fundamental to our everyday work. In articles, as in life, it is not what you do but how you do it that differentiates the man from the fellow. There is no subject so abstruse that its fundamental principles may not be stated so tersely that they can be comprehended easily. My hope is to thus simply and clearly present the essential principles of Pathology.

Pathology is the study of diseased or perverted functions, as distinguished from Physiology, which considers healthy or normal functions. This change from the healthy function is an effect, and, like all other effects, must have a cause. The ascertaining of the cause or causes constitutes the central idea in all diagnostic efforts, and their removal, followed by the restoration from structural or functional disturbances, is the object aimed at in all therapeutic endeavors. "Remove the cause" is not only the first law of Surgery, but the watchword of reformation in all realms—physical, mental and even moral—in which we live and have our being. In the treatment of disease it is the golden text, and should be the beginning, the continuance and the end of instruction.

The *causes* of pathological conditions are very naturally divided into two classes, those from *within* and those from *without* the organism. In point of frequency, as in ease of comprehension, those from the outside are the most prominent. They are "unsanitary surroundings," "outside interferences" and all causes which are not born of and inside the organism. This of course includes all types of microorganisms, which, while proliferating within the organism, are not born of it and are foreign inhabitants therein.

The other class comprises a more obscure and oftentimes intangible source of disturbance, generally brought within the term malnutrition, or those influences that pervert the course of nature and bring deformity. This second class constitutes the special field for the enterprising theorist, the "green pastures and still waters" of the visionary etiologist, and yet remains the great terra incognita of the medical philosopher and scientist of the present and future. With all that modern extension of observation into the very *ultima Thule* of cell-life has attained, and with all the focalization of interested human agency in the possession of this key to the situation, the best conclusions regarding the nature of this class of causes are but gropings in the dark. Intangible causes of perverted nutrition, act-

ing in the obscure land of material formative possibility, have as yet evaded the keenest, most interested scrutiny of modern, Argus-eyed science. We know the results, the effects, but must still *speculate* as to the *what,* the *how,* and even the *wherefore.* In this field it is possible that he knows the most whose imagination rises upon tireless pinions and whose scientific gaze does not blink in the face of the sun.

In the second class we know more. "Unsanitary surroundings," as a cause of pathological conditions, are not absolutely defined. Broadly stated, we think we know what is meant by surroundings that produce disease, but when we see that what is one man's poison is the other man's meat, our certainty grows less certain. Nevertheless, we accept such when generally stated as one of the understood causes of pathological conditions. "Outside interferences" are plainer still. We can readily accept this class and are not doubtful in placing it as certain causes easily understood. Lesions, wounds of all kinds, poisons—local and general, these and their thousand and one modifications are accepted and known by all men. With equal certainty, and yet with less definiteness of limitation, do we also accept and understand microorganisms as causes of pathological conditions. It is not necessary here to attempt any classification, however brief, but it will be sufficient to say that some microorganisms are disease-producing and others are not. We shall not attempt to separate these two general classes, for our purpose is to indicate, not exhaust, and we feel we can rest secure upon the above general statement in the presence of such a body as this.

But what are these microorganisms? We know, though the world at large does not, that they are members of the vegetable kingdom just as definitely as are trees, flowers, cereals and all those forms of plant life with which the world is familiar. The fact that they are microscopically small, and uncountably numerous, and marvelously capable of reproduction, and constantly present in air and earth and all organic tissue, has given to them the suggestion of mysterious powers of activity far beyond the appreciation of the ordinary mind. It comes almost in the nature of a shock to declare that they are dependent upon their environing conditions, and are as much limited in growth and development by the presence or absence of favorable surroundings as the fragrant pets of the greenhouse or the whole-

some friends of the kitchen-garden. No one wondered when it was found that the wheat in the dark, dry, cool chambers of the Pyramid had failed to germinate, and only a few marveled when heat, light, moisture and earthly food caused the latent powers of development to produce the blade, the stalk and the ear, but when this clear process is applied to those minute plants called germs the analogy passes into the incomprehensible. The attending mysteries of only microscopical observation, and only laboratory study, and the general, awe-inspiring responsibility of being the cause of the ills that flesh is heir to, have confused the minds of the masses and they refuse to accept such a simple and everyday analogy.

It is not hard to believe that heat and moisture and food of a proper kind are essential to organic life, but the mind seems to "go up into the air" when asked to apply such familiar necessities to viewless creatures invested with powers so potent when in action. We accept the statements with equal minds from the biologist and agricultural chemist that animals and plants alike depend upon the supply of food and the favorable circumstances otherwise, but we shake our heads with ill-concealed doubting when such common sense is applied to microbes. We recognize the necessity of organic disintegration and ultimate solution of the food products for the sustenance of our own bodies, and yet we wonder why fermentation is an essential to the well-being of microscopic organic life. With this analogical key we may unlock many mysteries. Sanitation, state medicine, may be summarized as an effort to produce a famine in the land of the micro-entities. Health-seeking in dry altitudes is the encouragement of High License among the Bacilli, thereby limiting their power. Germicides, antiseptics and disinfectants are only the minions of Pharoah Scientificus seeking the death of the first born from the palace to the hovel.

Said the microbe to the germlet as they paused to get their breath,
In the giddy dance of being—proliferation—death,
"Have you heard the latest mandate that high Jove's put on the rig,
Since he's quit the lightning business and is resting on his dig?
Well, I'll tell you, it's a corker, just the thing we mites have needed
Since the earth and all its fullness to our special use was deeded—
'Change shall be the law unchanging from Creation's dawn to end,
Shown in ceaseless recreation from the wholes that ferments rend.'"

Now, then, we have seen that Pathology deals with perverted Physiology, and that every taking care of sick folks or sick things in our lives was being occupied in that realm. It is no unknowable world, although it may be unknown, and it is just as familiar in varying degree as the thousand and one ailments of life with which all must deal. We have seen that the causes of these pathological conditions when reduced to the simplest analysis are from two sources, outside and inside the organism. Looking a little further, we have seen that outside interferences and surroundings, lesions of all kinds, and microorganisms, which, while they inhabit are foreign to the human organism, constitute the causes outside; and that malnutrition or interferences of a less tangible form with the course of tissue-building and tissue-waste in the physiological activities of the organs make up the inside causes. We have seen that "unsanitary surroundings" are such a variable cause of pathological changes that while they are commonly accepted as an easily understood cause, they really afford grounds for much more discussion and investigation before the truth will be certainly known. Lesions, chemical and traumatic, appeal so directly to the senses that we feel they are understood. Microorganisms, or those organized ferments from a vegetable source that cause pathological changes by the liberation of by-products, are not so well understood, but still are less of a mystery than a few years ago.

These are the causes that produce the effect called disease. The simplest possible paraphrasing of that effect is Inflammation. All those causes produce a series of structural changes called inflammation, which exhibits a protean multiplicity of variation because the simple process is modified by the structure, or environment, or the degree of resistance of the *vis medicatrix naturæ*. If we get a clear grasp upon the simplest form of inflammation, understand its nature from inception to termination, and hold this definitely before our mind's eye, we can see the simple analogy growing more complex by easy stages that do not befuddle the mind. It is not always an easy thing to ascertain the cause, for irritation, shock, the vague and reflex beyond the ken of the most astute, give cause to a series of effects far out of proportion, as far as we may judge. Indeed, there is something quite uncanny in seeing living tissue pervaded all the time—we must admit—by the possible causes of pathological con-

ditions; and yet, day after day, even year after year, it is not upset by their presence, until all of a sudden the power to resist is lost and disease sets in just because there has been some modification of our Heaven-given tendency to get well and stay so. In the twinkling of an eye the kiss of a zephyr has lowered the resistance of our system, and the tell-tale sneeze announces the first, inconsequential step in a series that may end in death. The little "taking cold" is nothing, but if it is assisted by a still greater disturbance of the system's equipoise, coincidental merely, with its more pronounced lowering of vitality or lessening of the resistance to morbific influences, it may bring the organism within the baleful reach of the tubercle bacillus, which has up to then been vainly seeking food for his development.

In just such a vague and unexpected manner do we find inflammation of a most serious nature breaking the bonds that have been holding it in abeyance. It must be so, since no epidemic was ever universal, some individuals managing always to keep the immunity of molecular resistance to possible causes of disease present in their bodies. Inflammation in the early stage is nature's great rally to expel an intruder. No man knows of how many victorius repulses, or how many hairbreadth escapes possibly, he has been the ignorant and unappreciative recipient. Nature's sentinels have been on guard and her hosts have slept on their arms ever since we came squalling onto the battle-ground of life, and until life's fitful fever is over we may confidently rely upon that great recuperative power implanted within us and within all living organisms, whether vegetable or animal. If inflammation in the early stage is the rally of nature, the symptoms which always attend it are the signs of the losing fight which she is waging, that may be in part a defeat yet on the whole a victory, and we may always tell the stage of the series by reading the signs of symptoms.

The blood is the great first relief to the wounded upon which nature relies. Too much blood is an embarrassment of riches, and congestions become extensions of the trouble which they were created to relieve. Should nature be able to stem the tide of affairs, to remove the cause and hurry on the current of blood that has already begun to show a tendency to lag, and pass it on through the proper channels and into the far reaches of the capillary ramifica-

tions, then we have resolution, a resumption of function, and a re-establishment of Physiology. If, on the other hand, nature finds herself unable to cope with the persistent results of irritation, and the accumulation of well-meant blood, she gets to work to limit and circumscribe the effects. A wall is built up around the area and the fight to keep destruction inside the smallest possible space is begun.

This is nature's plan, and all efforts to cooperate should be exhibited with a clear comprehension of the end aimed at and the reparative efforts put forth. The terminations of inflammation are only the best compromises she can make under the circumstances. We may intelligently assist or we may blindly antagonize should our interferences be made without judgment. But why make the story longer? The mind can readily grasp the scheme entire and see the steps to be taken for cooperation, see the possible antagonisms which might arise to thwart, and see the ends aimed at from a judicious interpretation of all the signs and signals. The wonderful diversity of nature in form and feature gives us the unquestioned probability of myriad modifications. Therefore, the question of treatment must forever remain the burden of the hour, for a host of possibilities spring up at the very mention of pathological derangement. No man can ever hope to lift this burden from the shoulders of the man, and if any man can bear into the quiet chamber of his own soul the consciousness of having done his best at all times he should deem himself the most fortunate of mankind.

Discussion. *Dr. W. C. Barrett,* Buffalo: I can remember the time in the history of this Association when the presentation of a paper on pure pathology would have found but few to debate it, and when the treatment of a subject from a pathological standpoint would have emptied the house in a few moments. Nowadays, however, pathology receives more attention from this body than any other one subject, which is a marked advance.

This paper considers the change from the physiological—the normal, to the pathological—the abnormal, and as the essayist has stated, there are three methods by which this may be brought about: First, by unsanitary surroundings; second, by perverted or malnutrition, and third, by external influences. I am glad that he has given us such a broad basis upon which the subject can be considered, be-

cause all side issues are eliminated, and the thought is concentrated upon three distinct points. This is an excellent classification.

Dr. James Truman, Philadelphia: This paper is one of the ablest definitions of pathological conditions that I have heard for a long time. Thirty years ago I remember remarking to a distinguished medical colleague that the time would come when bacteria would be regarded as the source of all pathological conditions. He almost laughed in my face as he said: "They will probably be confined to three or four pathological conditions." Every one of us is well aware that to-day the majority of diseases are attributed to these minute vegetable products, and it is to them that we as dentists and pathologists must devote special attention. I am gratified that bacteriology has become an important study in all our dental colleges, and that the students of to-day are prepared to treat cases and to give an intelligent answer when asked concerning the cause of certain pathological conditions. It is the mission of dentistry to cultivate the minds, not only of this profession and of the medical profession, but of the great laity, so as to enable them to understand that it is unsanitary conditions of life which produce these pathological organisms. I would emphasize the necessity of prophylactic treatment, as I am thoroughly convinced that the bacilli of tuberculosis, being ever present in the oral cavity, are a constant source of disease and destruction to the human family. It is the duty of the profession to instruct the world concerning prophylaxis of the oral cavity, so that all forms of contamination therein may be removed and not be left to breed disease throughout the system.

Dr. Fillebrown remarked in his report that Miller did not find the gelatinous plaques of Williams a cause of decay. They are certainly not a cause of decay, although Williams has made that positive assertion. Nevertheless, there are certain accretions in the mouth of every individual that cannot be cleaned off, and given the opportunity, tuberculosis will certainly find a place therein for development. Can we not teach in our public schools and go forth as missionaries in regard to this matter, to make the world at large understand that dentistry is something more than the mere filling and extraction of teeth? We should be the leaders in all attempts to improve the condition of humanity.

SECTION V. Continued.

Third Molars.

PAPER BY C. N. PEIRCE, OF THE SECTION.

It is well known that in all animal life there are differences, that characters themselves are inconstant, that they may or may not appear in individuals of a species, and that under such circumstances these differences are not evidences of a break in the line of descent. In one genus we may have two tubercular molars in the inferior series, while in an allied genus three such teeth may exist, or in another but one. These conditions, when recognized, excite interest and comment, but the cause is not always apparent.

The normal dentition of man is, on each side: incisors, 2; cuspid, 1; bicuspids, 2; molars, 3; yet it is not uncommon to find in the higher races individuals who have only two molars, in one or both jaws, or if three are present, the third or posterior one is evidently a degenerate in every particular. From the frequency of this occurrence the usual estimate of the third molar is that it is variable in size, structure, durability, position and time of eruption. It is the purpose of this short paper to throw some light if possible upon the variability of this tooth, and to see if any cause can be assigned for this difference in size, structure, position, etc. While the lower third molar is the most typical in its character, yet the similarity with regard to their erratic condition is such that both the upper and lower should be classed together.

In the examination of the crania of the animals supposed to be next lower than Man, such as the Gorilla, Orang and Chimpanzee, of which many papers have been written, the third molar is with slight exception as large as the first and second, and in some cases a trifle larger, having abundance of room posterior to it, or between its distal surface and the ramus, in the lower jaw, to give free and unlimited use in the function of mastication. In addition to this, the

number and size of cusps, and the number, position and size of roots or fangs, correspond in every way with the teeth just anterior to them, the cusps especially being arranged according to the typical pattern.

In the lowest races of mankind the third molar is usually of large size, well formed, of dense structure, and seldom misplaced. In the examination of crania belonging to the native-born African we are certainly in touch with the least developed of the human family, and where it is fair to assume the food is coarse and uncooked, requiring powerful muscles and dense teeth for its mastication. Of these people we had one hundred and fifty crania under examination, and in these there were four hundred third molars in position. Three hundred and seventy-five of these were as large and well shaped as the molars anterior to them, twenty-four were smaller, and one was a small peg-shaped tooth.

On the examination of fifty crania of the Eskimos we were in contact with a people of whom the name would imply lived largely on raw flesh, it being their custom to consume fish and game in this manner. Their home has been Greenland, the Aleutian islands and Alaska. In these fifty crania were found one hundred and fifty third molars in place, one hundred and thirty of full size and like the first and second, save four had wrinkled masticating surfaces, such as are found in the Orang, twenty were smaller in size, with the cusps well defined.

The Chippeway Indians were in close contact, in location to the Eskimos, occupying the Southern part of Labrador, shores of Hudson Bay, and the lakes of Michigan and Superior. From their close contact with the Eskimos they partook much of their habits of life, and especially so in their food. It is not therefore surprising that we should find in them a close resemblance to their neighbors in tooth development. On the examination of twenty crania, sixty third molars were in place, fifty-two of these were large and well formed, not inferior to the anterior molars, while eight were smaller in size, some of them being much wrinkled on the masticating surface.

The Sandwich Islanders, or natives of the Hawaiian Islands, have lived upon pork and fish, both dried and fresh, also consuming a variety of fruit growing upon the Island in great profusion. On examining sixty-five of the crania of these natives, two hundred and thirty third molars were found in place, two hundred and ten

of these were large and well formed, while twenty were smaller than the first and second molars.

From the eastern portion of Siberia we have the peninsula of Kamchatka. This country is inhabited by a strong, hardy people, capable of any amount of toil and hardships and thoroughly inured to the severities of the climate. Eighty crania were examined, these had two hundred and sixty third molars in place, two hundred and twenty of them were of full size and density, while forty were smaller in size with imperfections in shape.

The Malay Peninsula is the most southern point of Asia. The natives are in a low state of culture, living entirely by the chase, pursuing the game with poisoned arrows. Eighteen crania were all to which we had access. These had thirty third molars in place, of which twenty-five were full size compared with the first and second, while five were smaller.

Notwithstanding the large population of India and the thousands that annually die, the collection of crania accessible is very small. The diet of the natives is largely vegetable, rice forming an important staple. The twenty crania examined furnished only thirty third molars in position, fifteen of these were large, and a like number smaller than the molars anterior to them.

The crania of the Egyptians were limited to twenty-five for examination. These had only fifty third molars in place; twenty-five of these were large and twenty-five small. Their diet, like the people of India, was largely vegetable.

The natives of Sweden, like the people of India and the Egyptians, divided the large and smaller third molars equally between them, there being only eleven in place in this small number of crania, five of these were large and six small.

Of the Peruvians we had only ten crania for examination. Thirty third molars were in place, ten of these were as large as the first and second molars, while twenty were smaller. This result was not surprising, as these people lived almost exclusively on cooked vegetable diet and fruit.

In the foregoing statement regarding the condition of the third molars in ten distinct varieties of the human family the writer is well aware that the number cited is meager, but great were the surprise and disappointment to find the molar in question so frequently lost or absent from the jaw examined. The bones in the cases neces-

sarily become dry, so that individual teeth drop out, and the third molars, where the crown and roots are reduced in size, are more liable to this displacement than any of the other teeth, hence the deficiency was in the locality that produced the greatest discrepancy in the examination.

As meager as the foregoing illustrations are, they give us a slight insight into the conditions under which we should expect to find a well-developed third molar, and without assigning any cause they indicate the nationalities where degeneracy of this tooth has certainly made perceptible progress. By adding the testimony of prominent and well-known observers it will be readily seen that modern life and higher civilization have decreased to a marked degree not only the size but the structure and general characteristics of this tooth, even to its complete absence in some families and its partial disappearance in many.

Dr. A. H. Thompson says: "In the lowest races of mankind the wisdom tooth is of large size and is seldom misplaced. It grows smaller as we ascend the scale of civilization."

Charles Tomes says: "In the lower races the wisdom tooth has ample space to range with the other molars. It is a fully developed upper or lower molar and has the characteristic pattern, that is, quadricuspid if above and quinquicuspid if below, and the roots are like the corresponding molars."

Darwin says: "In civilized man the degraded condition of this tooth in its degeneracy and imperfection is very great, as compared with the nearly perfect condition of the same organ in the lower primates. Still more marked differences are found between the savage and civilized races than between the savage races and animals."

Prof. Schaaffhausen accounts for "this difference between the races by the posterior dental portion of the jaw being always shortened in those that are civilized, and this shortening may be attributed to civilized man habitually feeding on soft, cooked food, thus abridging the use of his jaws. Of seven hundred and sixty-three persons over twenty-six years of age three hundred and forty-two were males and four hundred and twenty-one were females; forty-two per cent of the males and thirty-eight per cent of the females possessed no third molars." He states further that as there is no space between the second molar and the angle of the jaw after the twenty-sixth year,

ing in the obscure land of material formative possibility, have as yet evaded the keenest, most interested scrutiny of modern, Argus-eyed science. We know the results, the effects, but must still *speculate* as to the *what,* the *how,* and even the *wherefore.* In this field it is possible that he knows the most whose imagination rises upon tireless pinions and whose scientific gaze does not blink in the face of the sun.

In the second class we know more. "Unsanitary surroundings," as a cause of pathological conditions, are not absolutely defined. Broadly stated, we think we know what is meant by surroundings that produce disease, but when we see that what is one man's poison is the other man's meat, our certainty grows less certain. Nevertheless, we accept such when generally stated as one of the understood causes of pathological conditions. "Outside interferences" are plainer still. We can readily accept this class and are not doubtful in placing it as certain causes easily understood. Lesions, wounds of all kinds, poisons—local and general, these and their thousand and one modifications are accepted and known by all men. With equal certainty, and yet with less definiteness of limitation, do we also accept and understand microorganisms as causes of pathological conditions. It is not necessary here to attempt any classification, however brief, but it will be sufficient to say that some microorganisms are disease-producing and others are not. We shall not attempt to separate these two general classes, for our purpose is to indicate, not exhaust, and we feel we can rest secure upon the above general statement in the presence of such a body as this.

But what are these microorganisms? We know, though the world at large does not, that they are members of the vegetable kingdom just as definitely as are trees, flowers, cereals and all those forms of plant life with which the world is familiar. The fact that they are microscopically small, and uncountably numerous, and marvelously capable of reproduction, and constantly present in air and earth and all organic tissue, has given to them the suggestion of mysterious powers of activity far beyond the appreciation of the ordinary mind. It comes almost in the nature of a shock to declare that they are dependent upon their environing conditions, and are as much limited in growth and development by the presence or absence of favorable surroundings as the fragrant pets of the greenhouse or the whole-

some friends of the kitchen-garden. No one wondered when it was found that the wheat in the dark, dry, cool chambers of the Pyramid had failed to germinate, and only a few marveled when heat, light, moisture and earthly food caused the latent powers of development to produce the blade, the stalk and the ear, but when this clear process is applied to those minute plants called germs the analogy passes into the incomprehensible. The attending mysteries of only microscopical observation, and only laboratory study, and the general, awe-inspiring responsibility of being the cause of the ills that flesh is heir to, have confused the minds of the masses and they refuse to accept such a simple and everyday analogy.

It is not hard to believe that heat and moisture and food of a proper kind are essential to organic life, but the mind seems to "go up into the air" when asked to apply such familiar necessities to viewless creatures invested with powers so potent when in action. We accept the statements with equal minds from the biologist and agricultural chemist that animals and plants alike depend upon the supply of food and the favorable circumstances otherwise, but we shake our heads with ill-concealed doubting when such common sense is applied to microbes. We recognize the necessity of organic disintegration and ultimate solution of the food products for the sustenance of our own bodies, and yet we wonder why fermentation is an essential to the well-being of microscopic organic life. With this analogical key we may unlock many mysteries. Sanitation, state medicine, may be summarized as an effort to produce a famine in the land of the micro-entities. Health-seeking in dry altitudes is the encouragement of High License among the Bacilli, thereby limiting their power. Germicides, antiseptics and disinfectants are only the minions of Pharoah Scientificus seeking the death of the first born from the palace to the hovel.

Said the microbe to the germlet as they paused to get their breath,
In the giddy dance of being—proliferation—death,
"Have you heard the latest mandate that high Jove's put on the rig,
Since he's quit the lightning business and is resting on his dig?
Well, I'll tell you, it's a corker, just the thing we mites have needed
Since the earth and all its fullness to our special use was deeded—
'Change shall be the law unchanging from Creation's dawn to end,
Shown in ceaseless recreation from the wholes that ferments rend.'"

thousands the results of a science completely mastered, we must have a more perfect education.

The proposed lengthening of the course of study is at once an evidence of our desire to send out more skillful practitioners and unite our larger skill to the great needs of suffering humanity. I allude particularly to the National University, the Polytechnic School of Pittsburg, the prospects of enlarged university facilities, and the Evans' fund. I recommend that a committee be appointed to look after the interests of our profession in this matter. The New York State Dental Society has taken the initiative step, and this Association should give all the assistance it can. It seems to me it would be better to do this work in the name of the National Dental Association, giving the New York Society due credit and a representation on the committee.

The National Dental Association is a delegate body representing the organized dental profession of this nation, and being a delegate body, its work is for the benefit of the whole organized body of dentists. Its membership is not merely the few who come as delegates and bear the burden of the work and expense, but every member of a state or local society which is represented by a delegate is in the same relation to this Association as every citizen is to our government. A citizen is a supporter of the government—this country is governed by representatives elected by the people, and the same rule should prevail in this Association. Our work is for the advancement of the whole profession and should be supported by it, instead of the burden falling exclusively upon those who devote their time, energy and talents to the work. It is the duty of every society represented in the National Dental Association to acknowledge its allegiance to it by contributing to its support. If every society would pay the small tax of one dollar for every delegate to whom it is entitled, it would increase the fund in the treasury to such an extent that this Association could accomplish vastly more than is possible under the present plans. We could encourage investigation to a greater extent, we could print our own journal, and place it in the hands of the members immediately, all the journals having the same opportunity of using any of the material they wish, instead of making a privileged journal, and having transactions come to the members as evidence of something that has gone before. As the permanent mem-

bership increases it is losing its identity as a delegate body and assuming an individuality—merely a society—and as such its influence with the organized profession will decrease. Let us maintain the representative character so ably advocated by Dr. Black in his address last year.

Legislation. One more state, Ohio, has by an act of legislature joined the ranks of those requiring examination for license. I regret they were unable to place the nominative or selective power with the state society (as no one is as competent to select examiners to conduct a professional examination as members of that profession who take an active interest therein); also, the placing of examination papers on file in the State Department. The discretionary feature is a good one if it is so guarded that abuse of that power cannot result.

In Pennsylvania the five schools and the state board of examiners have always worked in harmony. Since the establishment of the law of 1897, requiring examinations of all in possession of a diploma, and desiring a license to practice in the state, they are working together to improve the conditions from an educational standpoint, and the results have been a marked improvement in the personnel of the students, as well as in their training in the different branches. Quite a rivalry seems to exist among the schools to have their students make the best average in the examinations, and with this spirit extant good results must necessarily follow. All possible safeguards must be adopted to secure perfect fairness in examinations, if such commendable rivalry is to be maintained, instead of competition on lower planes.

The state supervision of dental education and the licensing of practitioners in Pennsylvania are greatly safeguarded through the work of the Dental Council, a body composed of the State Superintendent of Public Instruction, the President of the State Board of Health, the Secretary of Internal Affairs, and the President, for the time being, of the Pennsylvania State Dental Society. The Council passes upon the credentials of the applicant, including the matriculation requirements which have been recorded by the Superintendent of Public Instruction. A card of admission to the examinations is then given to the applicant to present to the board. As soon as the examination is completed a report of the marks on individual branches and the general average, signed by each member of the board, is sent to the

Secretary of Internal Affairs, who is also secretary of the Council, and placed on file for five years, subject to public inspection the same as any conveyance of land.

The members of the examining board are nominated by the state society, two for each vacancy, and from these names the Governor shall appoint the required number. They must be members of the state society (which is a representative body of the dental profession of the state), in good standing and have had ten years' practice. There is no act of the board which is not by law open for public inspection. In addition, the State Department issues a report of the work of the board, including the name of the applicant and college, and the marks on each division with the general average. All the questions are likewise submitted, but in case of failure the name of the applicant is withheld.

The licenses are issued by the Council, signed by its President, the Superintendent of Public Instruction, the Secretary of Internal Affairs, and by each member of the Board of Examiners; therefore the examiners are a part of the educational system, and not, as frequently alluded to, a committee for enforcement of law. If all the states would adopt a law similar to this there would be no occasion for the criminal charges brought against a member of a state board last year.

I have taken the liberty to call your attention to the Pennsylvania law because its enactment was the culmination of ripe consideration of the principles which the dental profession of that state felt should govern our standards of education. Five years' experience in its practical operation has demonstrated that it is founded in equity to all concerned; hence it has been productive of a better class of licenses by eliminating the unfit, and has enlisted the harmonious and cordial support of the teaching institutions of the state.

Recent Publications. We have among recent publications, "Answers to Questions Prescribed by Dental State Boards," by Robert B. Ludy, M. D., Philadelphia, Conover Publishing House. The first sentence of the preface is, "To pass creditable examinations is the laudable ambition of every earnest student. Many persons having an adequate knowledge of the subject in which they are tested fail because of their inability to interpret properly the intents and purposes of the questions to be answered by them." The July *Cosmos* in its bibliographical department expresses my views so clearly that I

refer you to it instead of quoting it. The function of the state board is to discover the student's general knowledge of the subject, which it cannot do in an answer of one, two or three sentences. The students who depend on this cramming process will not make high averages. I believe it is our duty to express our views as stated in the article to which I refer, "That we are firmly opposed to the idea which prompts the publication of a work of this character, for the reason that we do not believe it to be subservient to any legitimate educational end."

Honorary Degrees. The New York legislature, in a bill signed March 28, 1901, gave to the Board of Regents authority to exchange the M.D.S. degree for the D.D.S. degree, the former (M.D.S.) being strictly a local degree conferred by the Dental Society of the State of New York, and the said Board of Regents at its annual meeting, July 1, 1901, declined to exercise the power conferred by the act quoted and referred the subject to the Dental Society of the State of New York for a definite report on the matter. The National Association of Dental Faculties at its meeting last year tendered a vote of thanks to the Board of Regents for its action, accompanied by a protest against any attempt to confer honorary degrees. At the last meeting of the Dental Society of the State of New York the act of assembly conferring this questionable power upon the Regents was approved by a large majority. Standing Resolution No. 6 of this Association, which is in force at this time, is as follows—"*Resolved,* That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice." It would seem to be the duty of this Association, representing the organized dental profession of the nation, to give an expression of opinion upon this matter.

Dental Surgeons' Corps, U. S. A. The Surgeon General of the Army, in answer to my request, informed me that he had made application to the War Department that Dental Surgeon John Hess of West Point (one of the Examiners of the Army Dental Corps) be detailed to attend this meeting as its representative. I suggest that he be requested to give us some information as to what is being accomplished by the Corps. I have received letters from different members of the Corps, giving in detail their method of procedure in

examinations, operations, etc., as well as the amount of work accomplished; all of which shows the wisdom of the Department in establishing a Dental Corps in the Army.

The Committee on Army and Navy Legislation have been engaged in active work with the view of establishing a commissioned Dental Surgeons' Corps in the Navy, and making the Army Corps a commissioned instead of a contract Corps. While they have not met with the success hoped for, they are sanguine of success in the near future, the question of rank being the principal stumbling block. This Committee should be continued and instructed as to the rank for which they should contend.

The relation of dentistry to the defensive arm of the National Government is in reality but one aspect of that still broader problem of the relation of our profession to the public health. The subject is as yet in its infancy, notwithstanding the fact that much thought and labor have been expended upon it, especially in a few European countries. Our rate of progress in this department of our profession is at present comparatively slow, mainly because of the lack of a ripened public sentiment necessary to the support of our efforts in that direction. That sentiment must be created, and it would seem that the intention of the thoughtful public could be best directed to the matter by an authoritative presentation of the existing need of intelligent dental care as a health measure. Such presentation to be effective must be based upon an exhibit of the conditions which result from the impairment of the teeth and diseases of the oral cavity due to ignorance and neglect, and this Association should take such steps as it may deem wise and effective to secure statistical data upon which may be based conclusions worthy of general dissemination, with a view to not only correcting existing evils, but of demonstrating the vital importance of our ministrations to the public health.

The International Dental Federation. The International Dental Federation and International Commission of Dental Education will convene at Stockholm on August 12. The questions to be discussed by the International Commission of Dental Education as published by its officers are—1. What preliminary knowledge is necessary for the dental student? 2. What part of the medical and scientific subjects should be taken up, and at what time of the period of training should the study of them be pursued? 3. What is the importance of the

theoretical technical knowledge? 4. What is the importance of the practical technical knowledge? 5. What are the most appropriate names for the several titles now used throughout the world? The Federation will consider these essential points in aiming to establish a harmonious educational system throughout the countries of the world.

The purposes and aims of the International Dental Federation have become sufficiently familiar to the dental profession of the world through the publication of its proceedings in our periodical literature during the past year. It is therefore unnecessary for me to refer in detail to the work of that organization. I deem it, however, to be my duty as well as my pleasure to speak in terms of high commendation of the purposes of the organization, and the spirit of international fraternalism of which it is the exponent. The progress of civilization which has placed at our command the means of annihilating time and space has in the same degree brought the nations of the earth into closer relationship, and the proximity has tended to remove suspicion and antagonism as it has engendered mutual regard and respect.

The world's profession of dentistry has not escaped this civilizing influence, and the International Dental Federation is the crystallization of an effort to unify and harmonize the best elements of dentistry among all the nations of the earth upon a higher plane of endeavor, to the end that our effort toward the betterment of our profession and of humanity may be enhanced. I would therefore recommend that our delegates appointed to represent this Association at the Stockholm meeting be instructed to convey the greetings and the assurances of the sympathetic cooperation of the American dental profession to the International Dental Federation in its noble work.

Forty-three years ago the preliminary meeting for organizing a National Association was held in this place. How well that work was done has been demonstrated by the progress that has been made along all the lines of our profession. Few of the organizers are left, but their work will go on and they will live in our professional history as those who planted that their children might reap. They sowed the seed, we are reaping the harvest. Let us always keep alive the same professional spirit, cultivating the soil in which they labored, so that those who come after us may enjoy the larger fruits of our endeavor.

Fig. 3 is a similar section to Fig. 2, giving an anterior view. Immediately below the dome of the skull are the meninges. It will be seen that the membranes in the center dip downward to form the falx cerebri, and in the region where the section has been made the lower edge is attached to the posterior portion of the crista galli. At the top of the falx cerebri is a V-shaped cross section of the

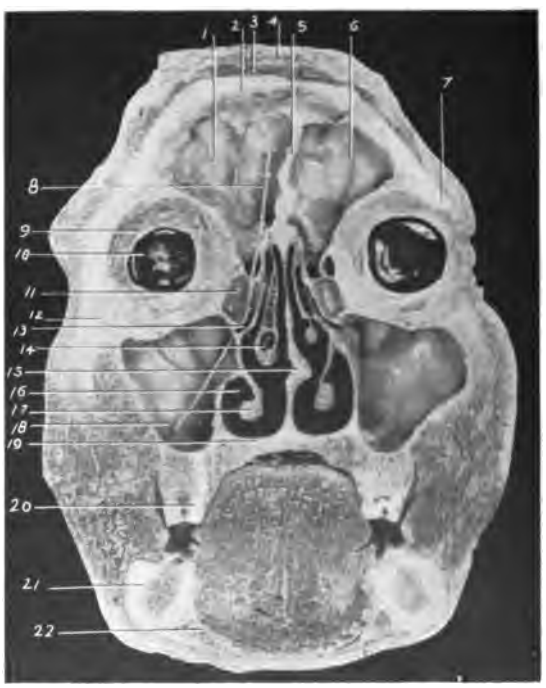


FIG. 2.

1. Frontal sinus. 2. Frontal bone. 3. Frontal muscle. 4. Skin and fossa. 5. Septum. 6. Frontal sinus. 7. External angular process. 8. Wire passing from frontal to maxillary sinus. 9. Tissue of eye. 10. Choroid coat of eye. 11. Anterior wall of bulla ethmoidal. 12. Malar bone. 13. Hiatus semilunaris. 14. Middle turbinate bone. 15. Septum. 16. Inferior meatus. 17. Inferior turbinate bone. 18. Maxillary sinus. 19. Hard palate. 20. First left maxillary molar. 21. Section of mandible. 22. Mylo-hyoid muscle.

longitudinal sinus. The frontal lobes of the brain show various convolutions, and it will be noticed that they are not symmetrical. Immediately below the brain are the thin inner walls of the frontal sinuses, showing that in this case the sinuses pass well backward and outward over the orbits. The outer wall of the sinuses forms a por-

tion of the inner and upper wall of the orbits. Below the sinuses are shown the cross sections of the orbits and eyes, the various recti muscles of the eye, the optic nerve, the ophthalmic arteries and veins. Between the orbits are the cross sections of the middle ethmoidal cells. Within the nasal chamber are cross sections of the septum and the middle and inferior turbinate bones. On the right side of the lower portion of the nasal fossæ are the maxillary sinuses, showing their posterior walls. For the general description of the lower portion of this figure see the description of Fig. 2, with the exception that the tongue is irregular in its outline, caused by the contraction of the alveolar arches.

Fig. 4 shows how the face can become narrowed or compressed until the maxillary sinuses are lacking. The alveolar processes do not extend outward and down in a curved direction, as shown in Figs. 1 and 2, but descend almost vertically. The two cross sections of the mandible are closer together than those in Figs. 1 and 2. Through the narrowness of the mouth the tongue is much crowded, and its upper outline is much deformed instead of being like that in Fig. 2.

Fig. 5 is a posterior view of a vertical transverse section of a skull which is far from being typical. From above may be seen the skin and the tissue covering the cranium and part of the anterior wall of the anterior fossa of the brain-case. Below this and above the orbits are the frontal sinuses. In this particular skull there was not a complete posterior wall to the left frontal sinus. The brain, apparently in normal condition, was extended forward to the anterior wall of the sinus, filling it completely. Had the surgical operation for tapping the sinus been performed, the brain tissue would have been reached in this case. The transverse sections of the orbits and eyes are fairly well shown; the ethmoidal cells are not so distinct as in the nearly typical skull shown in Fig. 2. The nasal fossa is very much deformed, caused by contraction, and the septum is deflected to the right side, coming in contact with a deteriorated inferior turbinate bone. The upper jaw and the tongue are narrow, while the palatal process has become thickened. There are also processes of the tongue extending laterally into the spaces unoccupied by the lost teeth, and the cheek on the right side has passed inward until it has become overlapped by the tongue.

Fig. 5, made from the same skull as Fig. 4, is an anterior view of a vertical transverse section cut just back of the posterior nares.

From above may be seen the skin and the tissue between it and the skull. Beneath the dome of the skull a cross section of the parietal lobes of the brain is seen with the falx cerebri between them, from their upper portion the falx cerebri extends downward to the corpus callosum, beneath which may be seen the cross sections of the lateral ventricle of the brain. Under the parietal lobes on each side are the cross sections of the temporo-sphenoidal lobes, with the body of

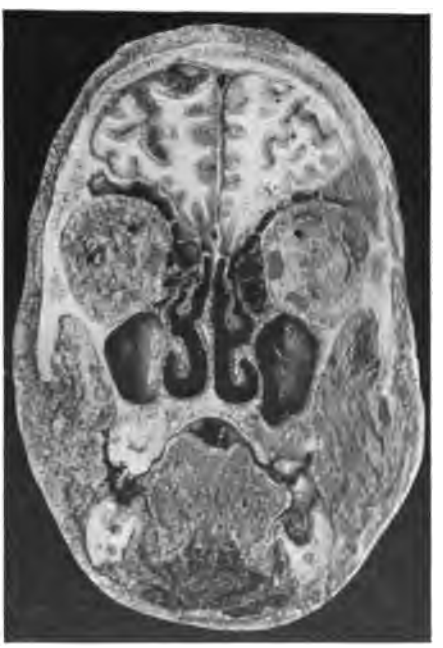


FIG. 3.

the sphenoid bone between them. The most important feature of this section to the stomatologists, and to those who make a special study of the treatment of these parts, is that the naso-pharyngeal space has become almost closed by the enlargement of the glandular tissues of this region, which will be again referred to. If that portion of the tongue back of the transverse section should be removed, it would expose the tip of the uvula, the tonsils, the palatoglossi muscles, the postpharyngeal wall, and the anterior convex portion of the epiglottis as shown in Fig. 6.

Fig. 6 is a similar section to Fig. 5, but from another skull. The brain is not well defined in the illustration; the sphenoidal sinuses are shown. The air passage leading from the nose into the pharynx is not closed, as shown in Fig. 5. The posterior portion of the tongue has been removed, thus exposing what is usually known as the oral pharynx, with the soft palate and uvula above. The post-pharyngeal wall is at the back, while the tonsils are at the sides. A little laterally and partly covering them are the two palatoglossi muscles. Below this is the oral or convex surface of the epiglottis. Beneath the oral pharyngeal space is part of the base of the tongue, and the epiglottis, while below this is a longitudinal section of the larynx. At the sides and above are sections of the thyroid cartilages, with the sections of the cricoid cartilages below. The space of the larynx is between these four cartilages. A little above the thyroid cartilages may be seen the cross sections of the greater cornua of the hyoid bone.

Fig. 7 is also a similar section to Fig. 5, giving a posterior view, though cut a little further back. The Island of Reil is shown in the cross section at a point where the temporo-sphenoidal lobes unite with the parietal lobes. The rounded space in the center of the base of the brain is the pocket which contains one-half of the pituitary body. On the outer boundary of this space are the internal carotid arteries passing upward and assisting in forming the Circle of Willis. Below the outer portion of the temporo-sphenoidal lobes the section passes through the anterior portion of the glenoid fossa and the condyloid processes of the mandible, beneath which may be seen the distal portion of the rami. Below the body of the sphenoid bone is the soft and muscular tissue of the postpharyngeal wall, and under this is the opening looking forward into the mouth. The palato-pharyngeal muscles are on the sides and between these muscles and the rami of the mandible may be seen various cross sections of nerves and vessels.

Fig. 8 is a sagittal section through the center of the head and the face. To fully describe the anatomy shown in this section would require more time than is allotted to me, and I will therefore speak only of some of the most important parts. Beneath the dome of the skull may be seen the inner right half of the cerebrum, below its posterior portion is the cerebellum, with the corpus callosum, corpora quadrigemina, peduncle and pons Varolii, with the medulla and spinal

cord passing downward. Between the cerebellum and the medulla is the fourth ventricle. In front of the spinal cord are sections of the bodies of the vertebræ; the white intervertebral substance may be seen between them. In the upper portion of this section of the face may be seen the right frontal sinus, with the crista galli just posterior to it, below this is the right nasal fossa with its turbinate bones and its meati. Posterior to the upper portion is the sphenoidal sinus.

FIG. 4.

Back of the lower portion is the posterior nares, where the nasal fossa opens into the upper portion of the pharynx. The floor of the nasal fossa extends from the anterior nares backward in a dome or convex-shape and terminates close to the postpharyngeal wall, leaving but a small opening in the median line. The incisor teeth are in about normal occlusion. The longitudinal section of the tongue and its radiating fibres are beautifully shown. The fibres commence principally from the genial tubercles, the upper fibres are the genio-

glossus, while the lower ones are the geniohyoglossus. At the base of the tongue is a transverse section of the hyoid bone. The epiglottis is well shown passing from the base of the tongue upward and backward until it nearly reaches the postpharyngeal wall. Below this is the larynx.

The Tongue.—Gray, Allen and other leading anatomists describe the tongue as being "situated in the floor of the mouth in the interval between the lateral portions of the body of the jaw." It is evident that they did their dissecting upon somewhat dried subjects, similar to that shown in Fig. 1, and when they examined the living subject it was naturally with the mouth open, and consequently the hyoid bone and all associated with it were drawn downward.. When the mouth is closed in the normal living subject the tongue almost completely fills the space from the floor of the mouth to its roof, from the anterior teeth to nearly the postpharyngeal wall, and from the premolar and molar teeth on one side to those of the other, so much so that the sides of the tongue are more or less indented by pressure against the teeth, and the buccal surface of the cheeks is in somewhat the same condition, though when the mouth is thrown wide open those indentures are usually lost. If a tooth be lost the tongue will pass outward into the space that it occupied, while the cheek will pass inward endeavoring to meet the tongue. See Figs. 2, 3, 4 and 5. It is due to this cause that a space feels so large to the tongue when a tooth has been extracted, as it does not come in contact with the usual resistance when an artificial tooth replaces it, the tongue and cheek having nearly or quite met through the open space. See Fig. 5. The tooth feels large and uncomfortable, but in a short time the tongue becomes accustomed to the new tooth, or in other words, the soft tissues recede into the same position as before extraction.

It would be natural to suppose that the tongue, being so large and pressing outward, would have more or less influence in moulding the shape of the alveolar arches, but from observing various bilateral sections of the face shown in Figs. 3, 4 and 5 I would claim that the mouth has more to do in shaping the tongue than the tongue has in shaping the mouth. In Figs. 2 and 8 it will be noticed that the outer surfaces of the tongue are smooth and conform to the surfaces of the mouth, alveolar processes, and the teeth, while in Fig. 3, from a slightly narrowed skull, the tongue is somewhat compressed and

is irregular in its outline. In Fig. 4, from a much narrowed skull, the tongue is very much compressed and is quite irregular in its outline.

In Fig. 8 the epiglottis will be noticed at the posterior base of the tongue passing upward and backward. In discussing Dr. Roe's

FIG. 5.

paper, the sudden collapse of his patient was thought by some to be due to the tongue falling backward, which caused the epiglottis to close over the glottis. This I thought was partly a mistake, as I do not believe that the epiglottis acts as a lid to the glottis. It is more of a stationary organ, and its nearest relation to the glottis is when the larynx is raised toward it, and even at that time the epiglottis is carried upward with the base of the tongue and the hyoid bone. Some years ago I made a number of experiments upon several cats and dogs. After placing them under an anesthetic I

opened the tissue covering the region of the glottis and epiglottis in order to obtain a general view of the parts, allowing the teeth to remain in occlusion. By passing water into the posterior parts of the mouth with a syringe deglutition was forced. The water passed backward and downward, and in the act of deglutition the folds of the glottis would close the opening, but no special movement of the

FIG. 6.

epiglottis could be observed, even when water was injected between the folds of the glottis. The epiglottis has sometimes been lost in man by disease and traumatism without interfering with the functions of the glottis, and in many of the lower animals no epiglottis exists at or near the glottis at the base of the tongue, showing that it is not necessary for this organ to protect the glottis. I have removed the organ from several cats and allowed the parts to heal over, with no apparent difference in the deglutition or breathing. As the epiglottis is a concavo-convex organ, with the convex portion toward the mouth, it will act as a shield to the glottis and cause the

fluids to go to the right and left as they pass the partly raised tissue surrounding it.

During the surgical operation for removing the condyles of the mandible, the principal reason for the patient's failing to breathe properly was, that this operation allowed the lower jaw, the hyoid bone, the tongue and all the surrounding tissues of that region to

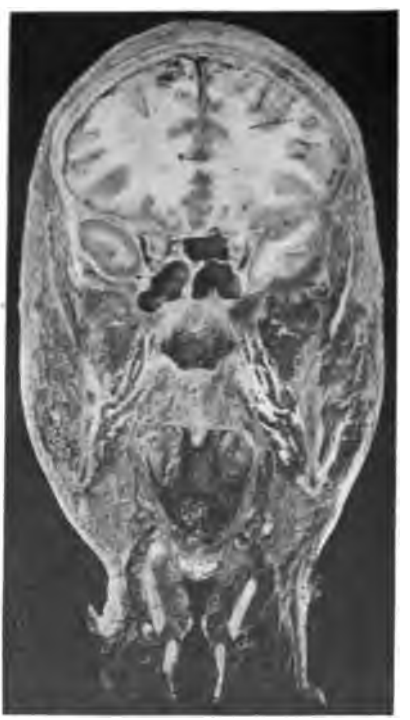


FIG. 7.

fall backward against the postpharyngeal wall, closing the pharynx, and thus shutting off the air before it can reach the glottis.

The roof of the typical mouth before the loss of the teeth and alveolar process is dome-shaped, both transversely and antero-posteriorly, and extends nearly from the anterior teeth backward to the postpharyngeal wall. See Figs. 2, 3, 4 and 8. During deglutition it extends completely to the postpharyngeal wall. The wall advances slightly to meet the uvula and the free edge of the soft palate.

After studying specimens similar to those from which these specimens have been made, I have been much better able to construct obturators for defective palates.

Both the medical and dental professions usually speak of the high arch of the mouth, as though the median line had been forced upward. If the floor of the nose of such mouths be examined no ele-

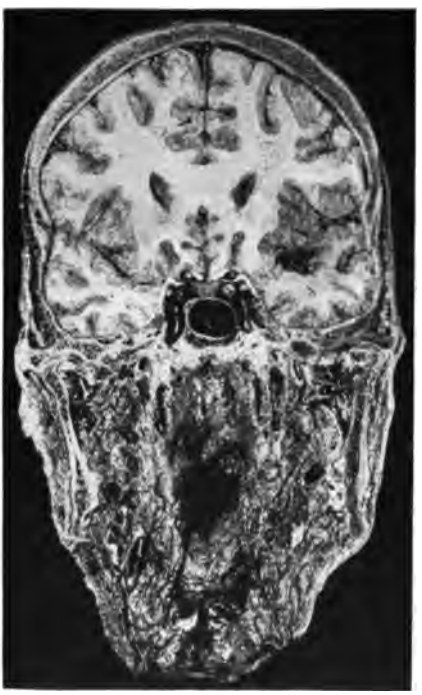


FIG. 8.

vation will be found, except perhaps under the cartilaginous portion of the septum. The floor of the nose posteriorly is held down by the vomer, which is seldom deflected. The principal reason for the high arch or dome lies in the length and position of the alveolar process. Instead of passing outward and downward in a curved manner, it passes more downward and is more or less elongated. Therefore it is the position of the alveolar process that gives the appearance of a high arch, rather than the elevation of the center of

the mouth. As has been already said, this is brought about by the lack of the precisive force of the lower teeth against the upper ones.

There are several factors which have more or less influence in modifying the shape and size of the maxillary sinus, the roof of the

FIG. 9.

1. Frontal lobe. 2. Meninges. 3. Corpus callosum. 4. Septum lucidum. 5. Skin. 6. Occipito-frontalis aponeurosis. 7. Parietal bone. 8. Parietal lobe. 9. Splenium of corpus callosum. 10. Occipital lobe. 11. Peduncle. 12. Pons varolii. 13. Torcular of Herophilus. 14. Fourth ventricle. 15. Cerebellum. 16. Medulla. 17. Uvula. 18. Recti muscles. 19. Genu of corpus callosum. 20. Foramen of Monro. 21. Anterior commissure. 22. Frontal sinus. 23. Crista galli. 24. Optic chiasma. 25. Sphenoidal sinus. 26. Superior meatus. 27. Superior turbinate. 28. Middle meatus. 29. Inferior turbinate. 30. Inferior meatus. 31. Hard palate. 32. Soft palate. 33. Uvula. 34. Genio-glossus. 35. Genio-hyo-glossus. 36. Epiglottis. 37. Glottis. 38. Fourth cervical vertebræ. 39. Inter-vertebral substance. 40. Trachea.

mouth, the nasal cavity and the positions of the teeth, and among the most important of these are adenoid enlargements and congenital and acquired cleft palate. The partial or complete closure of the respiratory tract is sometimes caused by bony deposit near the pos-

terior nares, which may or may not be congenital, but the most common obstruction in this region is in the form of adenoid growths. Fig. 5 is a marked illustration, showing the growth of glandular tissue of this region. It will be noticed that the space is almost closed. The enlargement passes forward as well as backward, causing a deformity of the nasal chamber. This condition compels the person to breathe through the mouth, which distorts the normal action of the various muscles of the pharynx, the tongue, of mastication, and of the face, and influences in changing the character of the bony structures. The occlusion of the teeth is also interfered with. The occlusion or constant pressure of one jaw against the other is one of the greatest factors in properly placing the teeth and in modeling the jaws, and through shaping the jaws the nasal fossa with its pneumatic sinuses and cells is influenced, and even the orbit and vision may be influenced by the enlargement of the adenoid tissue of pharynx. With such closure of the posterior nares the treatment for irregularities of the teeth must begin with the removal of these adenoid growths. If this is not accomplished almost all the mechanical appliances or interference with the teeth will be useless.

These are only a few illustrations selected from over one hundred slides which I have made from new frozen sections during the past winter. The work has been intensely interesting and I think would repay anyone who is at all interested in regional anatomy of the head and face.

SECTION V.— Continued.

Ethnographic Odontology; the Inca Peruvians.

PAPER BY A. H. THOMPSON, OF THE SECTION.

It is not my purpose to tax your patience by making any extended apology or giving any explanation of the general value of the study of the ethnology of the teeth. That has been done elsewhere. Suffice it to say now briefly that my studies in comparative odontology have naturally led up to the subject of the comparative study of the teeth of the various races of mankind, with the object of differentiating the characteristic ethnic features. I have been greatly disappointed that the literature of the subject, in which I hoped to find data from which to form deductions, was not only very meager, but that what little has been written upon the ethnologic characters of the teeth is of little value, owing to the want of exact observations of the minute anatomical features of the teeth, which we, as dentists, are accustomed to observing in practice. I shall not attempt to discuss what has been written upon the general subject at this time, but confine myself to the presentation of some original work that I have attempted in one small field, and which is intended to be more suggestive than exhaustive. I shall not even try to present an analysis of what I have been able to glean from this field, but undertake the description only of what I have observed. We are not yet in possession of the data to make any generalizations or deductions in any field of dental ethnology, so that our first duty is the accumulation of facts and their classification. That is what I shall attempt in this paper—the presentation

of classified observations in a very limited field. I hope also that this study will interest some of my hearers sufficiently to induce them to take up the investigation of some race that may lie at their hand, and thus contribute to the general fund of knowledge upon this important subject. We must have masses of facts, from which it is to be hoped in time that valuable deductions may be made, but

FIG. 1.

Elongated, compressed skull of Peruvian of the plateau.

that time is not yet, and we must avoid above all things too hasty generalizations.

I have been enabled to carry on some investigations upon the teeth of the ancient Peruvians in various museums of the United States which are especially rich in their skulls. I made extensive and minute notes upon about 500 Peruvian crania, from various parts of that country, and while this is not a great number, they

may be considered as fairly typical, and the averages would not probably be altered much in a larger number, considering the minute details noted. The conclusions, I think, may safely be trusted as fairly representative of the general characteristics of the whole people, but may perhaps be modified in some respects by further observations.

The ethnology of the Peruvian nations is very obscure and not well made out. Most writers speak of them as being rather heterogeneous, and that the empire of the Incas in its palmy days was made up of many various tribes which had been conquered and absorbed into its body, but without much assimilation. Prichard says that, "The Andean family comprehends the principal nations of the South American Cordillira, including Peru, Chili, and some adjoining countries. These nations, though differing in language and manners, have certain traits in common. They are of a clear olive brown and small of stature. The Quichua or Inca Peruvians were the most important of this stock, among whom nearly all the civilization of South America existed. The Quichuas were the dominent race and had considerable mental culture and ability, and developed a wonderful civilization on the high plateaus of the Andes. The Quichua Peruvians were of small stature, so that the skulls are not large, and those of the Incas and upper classes are refined and delicate in structure, quite like the better class of Europeans. They are, indeed, quite of the type common to highly civilized nations. There is considerable uniformity within different groups, as with the large, coarse Aymaras of the Titicaca region, who dominated the plateau, and of the other group, the smaller and finer Quichuas of the coast and the Inca classes. These were mixed during the progress of the Inca consolidation of the tribes of the regions of Peru, for the Incas had the policy of all great conquerors —of moving and mixing populations. So the two main types of the bandaged long-heads of the Aymara, coarse peoples, whose home was the plateau, and the other group of the smaller, refined type, Quichuas of the coast, who flattened their heads, are mixed considerably by immigration. Still, they were not homogeneous and are readily distinguished by their peculiarities, both osseous and dental."

The skulls of the Peruvians are usually small or medium in size,

and of the brachycephalic form, with a tendency to bulge at the parietals. The forehead is narrow and receding, and the glabella and superciliary ridges are not prominent, except in large, coarse skulls. The jaws are light and orthognathous, prognathism not being prevalent in the higher types. The head, being narrow at the frontal region, and wide and bulging at the parietals, presents a type that is striking and characteristic, but the most extraordinary thing about the Peruvian skulls is the artificial deformation that

FIG. 2.

Flattened, compressed skull of Peruvian of the coast.

was practiced for the mere purpose, apparently, of changing the shape of the head in accordance with the dictates of fashion.

Prof. J. Wyman says, "The Peruvian crania present two modes of artificial distortion commonly seen, namely, those from the chulpas or burial towers of the district of Lake Titicaca being lengthened, while those from nearly all other localities are broadened and shortened by flattening of the occiput. Round about Lake Titicaca and the region of the plateau are found the elongated skulls, which are altered in shape so as to be small in diameter and longer behind than normal. This was evidently accomplished in

infancy, while the bones of the head were soft and pliable, by binding with thick, stout cords of hair and wool, wound round and round. Skulls have been found with the tightly wound cords still in position. That children often succumbed to the cruel custom is evidenced by the number of young crania that are excessively elongated. These elongated skulls are found principally in the Aymara district, and it is supposed that this tribe inaugurated the custom, and it then extended to nearly all the region of the plateau and thence down to the coast. Along the coast the fashion of compressing the skull was different. The head was flattened from forehead to occiput as if between boards, so as to project greatly at the parietals. This was the style at Pachacamac, Aucon, and other coast places. This form is quite like that of the Flathead Indian and other tribes of the Northwest coast of North America. The bulging of the parietals is very marked, and is not always symmetrical, but often "lop-sided," so to speak. One side apparently got the better of the other and soon went beyond control and bulged permanently more than the other. A deep valley often ran over the parietal suture between the bulged sides."

M. D'Orbingy observes, "In the flattening of the frontal bone, in the projection that it forms over the bones at the upper part, there has evidently been compression before and behind, which has forced the mass of the brain backwards by pushing, as it were, the frontal bone over the parietals. . . . There is also obliteration of the sutures at all points affected by the pressure, even in the heads of the youngest subjects."

Our especial interest in these compressed crania is to observe if the custom had any effect upon the form of the jaws. We might expect that the distortion of the bones of the cranium would affect the position and articulation of the upper maxillary at least and cause deformity of the arch, but this was not observed in any of the compressed skulls examined. The arch was full and normal and of beautiful outline in nearly all that had full dentures. Neither the elongated nor the flattened forms seemed to present any deformity that might not have arisen from congenital causes. There were deformed jaws, of course, and some of them were associated with the artificially compressed skulls, but it was not appar-

ent that the deformity could have been in any way connected with or due to the compression.

One interesting feature was the frequency of the Inca bones in the lambdoid and parietal sutures, especially the former. They occurred with great frequency, of every size and location in these sutures, the most common perhaps being a large triangular bone at the junction of the sutures. The Incas made a specialty of them,

FIG. 3.
Elongated Inca skull, with double trephine.

so that the old name for these aberrant elements in their anatomy seems quite appropriate.

A conspicuous facial feature was the high nose, which the Incas and aristocratic classes possessed as an evidence of blue blood. It was a distinctly aristocratic feature, as is shown by the high nasal bones of the Inca. Mr. Squier found some of the descendants of the Peruvians in modern Chimu whose profiles compared with those of the portrait vases found in the ruins of Grand Chimu. Portraits of the Incas are also seen with this aristocratic feature, having noses quite of the high Roman type.

A matter of remarkable interest in the skulls of the ancient Peruvians was the number that had been trephined. This operation seems to have been a veritable medical fad among them, if we may judge by the number of skulls that have been operated upon. The operation was evidently performed with a graver or chisel, by simply gouging out four lines that crossed each other and cutting out a square piece. It makes us shudder to think of the operation. Let us hope that they humanely employed the narcotic and anesthetic effects of the coca plant which they used so extensively. That they survived the operation is attested by the skulls that have been found in which the trephined space is partly or entirely closed, with signs of inflammation of the bone. Other skulls show that the victim died before the operation was completed, as it was left unfinished.

The purpose of the operation is not quite clear. It may have had a superstitious significance, but that it was a fad or fashion there seems no doubt. It was probably a medical fad, like blood-letting in our grandfathers' days, and that they had the courage of their convictions the many skulls operated on attest. One reason for performing it probably was for injuries, and as a surgical procedure the treatment was rational. Small perforated wounds of the skull, such as would be inflicted with the star-like stone or bronze club that they used, or spear or arrow heads, would need just such an operation, and there are skulls with such injuries that have been treated by trephining.

The Teeth in General.—The teeth of the Ancient Peruvians presented some general characteristics that must first command our attention. In the first place, having an advanced civilization, we find some corresponding effects on structure due to such environment, as might be expected. Observations made on the skulls show that their civilization and luxurious surroundings, such as they were, had an effect upon the jaws and teeth, resulting in disease, deformity, irregularities, missing teeth, contracted jaws, delicate bones, etc., among the better classes. The writer was reminded that we would need to remodel our concepts in regard to the effects that civilization has had upon the teeth. A half century ago it was quite the fashion to assume that savage and prehistoric people had better teeth than civilized nations, and because they lived closer to nature and ate coarser food. Then some extensive inves-

tigations carried on in different countries on savage and prehistoric skulls disclosed the fact that there was much dental disease and deformity among them, and the pendulum swung too far the other way, and that is where we are to-day. But in the presence of the disease and deformity exhibited by the cultivated Peruvians, we will evidently need to remodel our theories again and return in a degree to the ideas of the pioneers of fifty years ago. This, of course, with some modification as to the prevalence of defective structure and disease as between savage and civilized nations. Here we have an ancient people, but one with considerable culture and living in luxury. Of course there was considerable abrasion of the occlusal surfaces, as might be expected with their usual diet—

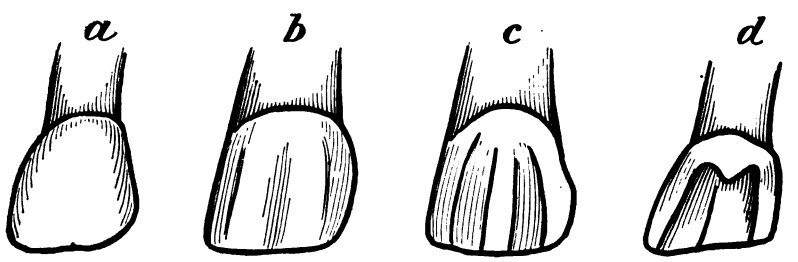


FIG. 4.

Upper centrals from Peruvian skulls. *a*. Narrow neck. *b*. Wide neck. *c*. Ridges on labial face. *d*. Ridges on lingual face.

maize, with its abrading silicious covering of the grain, the grit that entered into the meal prepared in stone mills, and other forms of coarse food. There was much evidence of alveolar abscess from this abrading and exposure of the pulp. Great cysts in the jaws told stories of suffering that were only too plain. No adult skulls were observed in which there was not considerable abrasion, and in the older ones it was very destructive. Only in the young skulls could the pattern of the occlusal surfaces be made out minutely. This wear of the teeth was probably often caused, as in the modern Peruvians, by chewing the coca leaf with its own silica, mixed with a gritty substance called *Llute,* made of wild potato, calcined shells and ashes of cacti, or other plants rich in alkali.

There was some caries which was occasionally very destructive,

but not a great amount. The percentage of carious teeth was very small.

Considerable salivary calculus was found in some skulls, but not many where it was present in great quantity. It was often associated with teeth that were extensively carious, and the disuse of one side had allowed calculus to collect on that side. The deposit was often discolored brown or green, which was probably due to the excessive use of coca leaves.

A remarkable circumstance was the frequent occurrence of teeth that were stained by coca leaves to a dark green or blue. This habit was and is to-day a most remarkable one. The leaves of the plant, *erythroxylon coca,* were considered sacred and the chewing of the leaves was accompanied with considerable ceremony. The plant has always been extensively cultivated in Peru and the use of it is of great antiquity. It is both stimulant and narcotic, and the habitual user requires very little food. Tschudi says "That all who masticate coca have pale lips and gums, and greenish teeth." As the leaves are mixed with unslacked lime in chewing, it is not surprising that the stain should be thorough and permanent. It would be interesting to make microscopic sections of coca-stained teeth to see how deeply it extends. It does not seem to be deleterious to health when not used immoderately among the Peruvians of to-day. Laborers demand it in order to sustain prolonged exertion, which it undoubtedly does. The amount of fatigue which it will enable the Indian to endure is something marvelous. It also assists respiration at high altitudes and materially aids in making life pleasant there. The plant was regarded as mysterious and religious, and was placed in the mouths of mummies and about them, so it entered into the life of the people to a great extent, both in utility and ceremony. It was a great gift to the world also, for the alkaloid, cocain, obtained from it, which we employ so much, has been of inestimable service in the alleviation of human suffering.

The deciduous teeth of the Peruvians were well developed, but without any special characteristics that would distinguish them from other races. This is not unusual, as they are always less differentiated than those of the permanent series. But they are strong and well developed, and show from the abrasion on the occlusal surfaces that they were well used. Like all the organs of

the immature individual, the deciduous teeth have few features that indicate the differentiation that is so apparent in the structure of the adult individual of the higher organisms.

The Upper Central Incisors.—There are some marked differences to be noted between the tribes of the coast and those of the plateau, in regard to the characteristics of the central incisors. The bandaged, elongated-headed people of the Titicaca region especially, who were largely Aymara stock, were larger and coarser in structure and the teeth and jaws partook of these characteristics. Some of the aristocrats, the Inca classes, of Quichua stock, as well as

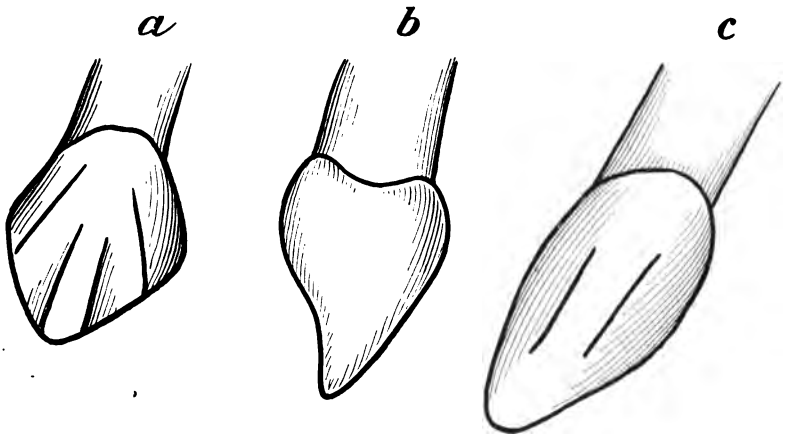


FIG. 5.

Upper cuspids. *a*. Spear-shaped crown. *b*. Mesial view. *c*. Conical form.

most of the people of the coast with flattened heads, were of smaller frame and finer organization. The Quichua skulls in the plateau region were of finer type and resembled the forms on the coast. These types are very interesting, and especially so by reason of their association with types of people that are so distinct. We find these qualities carried out in regard to many characteristics of the teeth.

Upper centrals were not very numerous as compared with other teeth, as they were more often absent from the skulls, probably owing to the short roots which allowed them to be easily detached and lost. Then those remaining were often much worn and abraded, usually to one-third or one-half of their length, and the special

features obliterated, so that the best specimens for study were found in young individuals, and especially when in the crypts and not yet erupted.

On the coast, as in the huacas of Ancon and Pachacamac, where the people were small and of delicate structure generally, we find some marked peculiarities of the upper centrals. They were medium to small in size, and of a general form in that the lower half of the crown was wide and parallel, and from there the crown tapered rapidly to a narrow neck. This form seems to be associated with the coast people, with fronto-occipital flattening of the head. The marginal and median ridges were not marked on the labial face. Transverse ridges were not uncommon, but as these were probably due to pathological causes, they are outside of our studies just now. The sulcus on the lingual face was well marked, with well defined marginal ridges. Cingules were very rare with these people.

With the coarse people of the plateau, of evident Aymara stock, the centrals were of different form. The main characteristic was, that with a large coarse crown with rounded face there was associated a wide neck that was conspicuous. Sometimes in the coarsest specimens there were strong ridges, both marginal and median, on the labial face. These features are distinctly low and apelike. The ridges on the lingual face were of course strongly marked in the coarse tribes, and the cingule occurred more frequently. The roots of the centrals were usually rather short and stout in the coarse peoples and smaller and longer in the finer tribes. Some abnormally short roots were observed.

The *upper lateral incisors* partake of many of the characteristics of the centrals, especially as between the coarser peoples of the plateau and the finer stock of the coast, i. e., the former have large coarse crowns with wide necks, and the latter have smaller crowns with narrow necks. In the unworn specimens of the laterals the edge is wide and well marked, defective crowns, as with Europeans, being almost unknown among the Peruvians, even with the delicate luxurious classes. No peg-shaped laterals were found at all, which would have been unusual if not impossible among a similar number of Europeans. On the plateau the necks were wide with strong ridges, and on the coast the crowns tapered rapidly to narrow necks

and with smooth labial faces. The lingual face was also more smooth on the coast among the finer Quichuas, but with the coarser Aymara peoples of the plateau this face was strongly ridged with a deep sulcus and occasionally a cingule. But even with the latter the cingule was singularly infrequent. Rarely the deformity of the deep groove crossing the basal ridge over onto the neck of the tooth was seen. A few supernumerary laterals were found, but rarely was one totally suppressed, as so often occurs in Europeans. This does occur, however, as has been described by Dr. Dorsey.

The *lower incisors* ranged in size from medium to small, especially on the coast, where they were often quite delicate in form

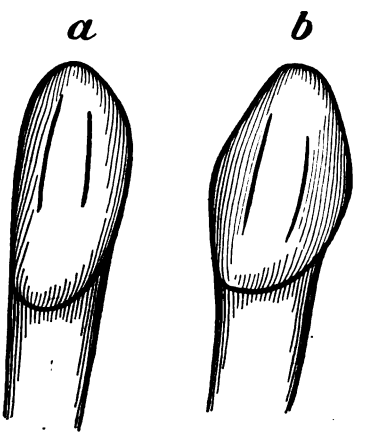


FIG. 6.

Lower cuspids. *a*. Ordinary conical form. *b*. Spear-shaped form.

and size. They were usually wide at the edge, especially the laterals, which had rounded distal corners when unworn. Rarely there was uniformity of width of the centrals and laterals. The necks were usually very narrow and delicate, especially in the finer Quichua types. Occasionally these teeth were very large, especially among the course types of the plateau, and in these the uniformity of size was quite apparent. Excessive wear had been very destructive of these small teeth, so that very few even of the few lower incisors remaining presented unabraded edges. The primitive edge

was found in young individuals, or in the rather numerous cases where irregularity of these teeth had removed them from the area of mastication or use. In such cases the edges were serrated as in the common type of these teeth in children.

The *upper cuspids* remaining are more numerous than the incisors, but present a larger proportion of excessively worn and fractured crowns. Having to bear the brunt of hard usage on account of their strength, the effects are only too apparent. It was rare to find an adult skull in which the cuspids were not worn off one-half or more, or much fractured. Of course this fact prevented the study of their main features except in young individuals. Too often only the general outlines could be made out.

The cuspids presented more variety as to form and size than the incisors. In general they were large and spear-shaped (i. e., the labial outline was like a spear head), with ridges more or less strongly marked on both labial and lingual faces. The labial face was usually full and round, especially towards the cervical border, and the mesial and distal angles were full and either sharp or round. This general form was apparent even when the crowns were worn away one-half or two-thirds, as was too often the case. In the older specimens the labial and lingual faces were worn smooth and rounded. Only in the young were the ridges apparent. The roots were large, long and deeply implanted, some crowns being one and a half inches long, and the eminence was well marked. In the coarser types they stood out strongly at the angles of the arch, making the characteristic squareness, but in more delicate skulls they were reduced, being small and depressed, and the arch was more rounded. In children especially, when the crowns were still in the bony crypts, the point was small and acute, showing a long and sharp type that is rather low. This was especially the case in the more conical types of the crown which occurred on the coast and among the Quichua tribes. In these finer types the cuspid was longer and more narrow, in conformity to the type of the teeth in general. This long conical cuspid is characteristic of many low races and of some of the quadrumana. Sometimes the bulge of the labial face was absent, as if worn away, and the surface was quite flat. This was found more among the coarse types of the plateau, the full face being found more in the conical types. Transverse grooves

were present on some crowns, but these were evidently pathological or were the result of the corrosive action of the coca-lime mixture that was chewed so much.

The *lower cuspids* do not present many distinguishing features. Like the most of the other teeth there are some differences between the coast or Quichua people and the plateau or coarse stock. In general these teeth are large and conical, but on the plateau they are larger, with a tendency to flattening of the labial face and spreading of the mesial and distal faces so as to approach the spear form of this face of the upper cuspids. On the coast they are more conical, with the labial face full and rounded, the mesial face flat and perpen-

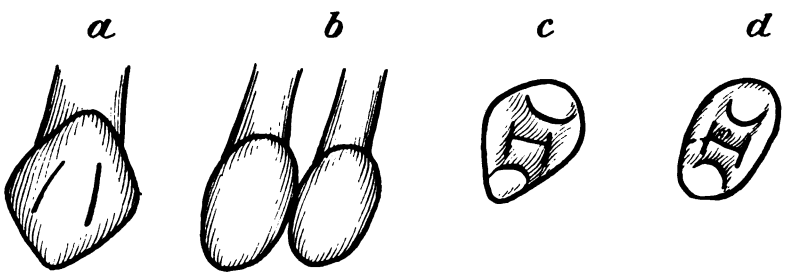


FIG. 7.

Upper bicuspids. *a*. Flaring form of buccal face. *b*. Oval form. *c*. Occlusal face, showing wide buccal cone and very narrow lingual. *d*. Oval form of occlusal face.

dicular, as in Europeans, and with more or less fullness of the distal strong ridges also in this class, but rarely or never a cingule. In worn teeth these ridges are of course obliterated and both faces of the crown become smooth, especially in the more conical cuspids of the finer coast people. With the latter both faces are more smooth than those of the plateau, at any rate. As these teeth were exposed like the upper cuspids to hard usage, they likewise became the victims of destructive abrasion, so that in all adult skulls they were much abraded and in aged subjects were worn to the neck. This fact face in the well known form. In the coarse form of the plateau there are often, in unworn teeth, conspicuous ridges on the labial face, at the marginal edges and in the middle. The lingual face has interfered with the study of their microscopic features except in young or unworn specimens.

The *upper bicuspids* in all of the Peruvians, except a very few skulls of very low and coarse type, were comparatively small—even more so than among Europeans—as compared with the other teeth in the same denture. This is in accordance with the idea of degradation due to defective structure consequent upon civilization. Both on the plateau and on the coast, among the coarse and finer types alike, the general form of these teeth is with the crown flaring on the buccal face, i. e., is much wider at the marginal ridges than at the neck. This form is modified in old skulls in which the teeth are much worn by the interstitial wear, when the proximate faces become quite flat. There seems to be a perceptible difference between the outlines of the crown of the bicuspids of the long-headed people of the plateau and the flat-headed people of the coast. In the former the buccal cone is quite wide mesio-distally and the lingual cone is much narrower in the same direction. On the coast, however, the two cones are more equal in size and the outline is more flat and less oval than on the plateau. This is only general of course, as exceptions occur among both peoples, as stray individuals of the other tribes may have been among them, but the rule as applied to both is sufficiently uniform to have a value for classification.

The *second bicuspids* were usually smaller and flatter than the first. With all of the features less strongly marked, the contrast was often striking. The excessive wear to which these teeth were subjected had the effect of obliterating the occlusal pattern in most of the adults and in all of the older skulls. When found in young individuals the cusps were well marked, rounded, and not much ridged or sharp, and very rarely were they high and strong, except in very coarse individuals. As a rule the cusps and ridges were not sharp nor well developed, but decidedly degenerate in type. No cases could be found in which three roots were apparently present, as sometimes occurs in low races as a reversion.

The Lower Bicuspids.—These teeth present so many distinctive features, and are so interesting from the ethnical standpoint, that it will be desirable to go into some detail in their description. The *first lower bicuspid* varies greatly in some of its features, and especially in regard to the lingual cusp or tubercle. This ranges all the way from a full form that is on a level with the buccal cusp, down to the mere tubercle like a cingule on the basal ridge. Between

these extremes there are all sorts of variations in regard to the height of this cusp. To distinguish these variations, it will be necessary to classify them in a scheme, something like the following: What we will call the *first* position of the cusp is that shown at a, Fig. 8, where the lingual cusp is on a level with the buccal, and together they form the full bicuspid type of the tooth. The wider marginal ridges make a different-shaped crown, but still this type of the full lingual cusp makes a bicuspid crown. The next is the *second* position of the cusp, when it is about ⅛ inch below the first (as at b). This is the type of most frequent occurrence in the Peruvians and

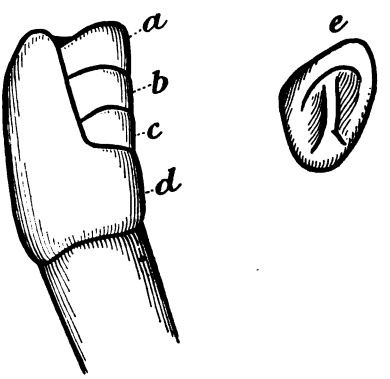


FIG. 8.

First lower bicuspid. *a*. First position of lingual cusp. *b*. Second position. *c*. Third position. *d*. Fourth position. *e*. Occlusal face, showing peculiar form of disto-lingual projection.

also in Europeans and other civilized peoples. The *third* position is that between the second and the fourth (as at c). The *fourth* position is the lowest (as at d). This is the lowest type of the crown, when it seems to be a mere cuspid with a cingule upon its lingual face, which is indeed the form of this tooth in the lemurs and the insectivora. By this classification, after making a tabulated arrangement of the percentages, the following averages were found among the Peruvians, taking all together: Five per cent had the lingual cusp in the first position and were of full bicuspid form; sixty per cent had it in the second position; thirty per cent in the third position, and five per cent in the fourth, i. e., a mere cingule on the basal ridge. Of course there were some differences between

the coarse tribes of the plateau and the finer stock of the coast, as with the other teeth, but this was not followed out.

Of other features, it was observed that the first bicuspids below were of larger size among the plateau tribes and smaller with the people of the coast. One general feature was the full bulge of the buccal face, which was well marked. Then also, the very wide marginal ridges usually exaggerating the well known bell-shape of the crown. Nearly all of these teeth are described as "flaring" in my notes.

Among the coast tribes there often occurs a form of the lingual cusp, mostly when it is in the third position, which is a peculiar feature. This is a prolongation of the lingual ridge disto-lingually so as to appear as a shelf or talon. This peculiarity was found in a number of cases. Sometimes the entire crown was also distorted to form a partial diamond-shape, although this talon occurred also when the crown was full and round. This is interesting as a unique and unusual feature, but it is without any ethnic significance that could be observed.

Among the coast tribes there is often a conical form of this tooth that is associated nearly always with the cusp in the third position or as a cingule. This is a low type, as it simulates the cuspid which, as observed before, recalls the form of this tooth in the lemurs and the insectivora.

Wear of course obliterated the lingual cusp when in the first position, and sometimes in the second, but unless it was very excessive the third position was not approached, hence a diagnosis could be made in most of the first bicuspids. The indications of the height of the cusp remained fairly well, even when the wear had been considerable. The transverse ridge was usually quite complete across the face of the crown. It was divided by a groove, of course, when the cusp was in the first position and sometimes in the second, but rarely in the third or fourth. But the ridge was always strong, whether divided or not.

The Second Lower Bicuspid.—The crown is of the typical bell-shape in most of the Peruvians; in all of my notes it is described as "flaring." Some are bulged on the buccal face, but as a rule not so much as the first. Indeed, the full or rounded buccal face occurs only on the very large, coarse specimens, as with the Aymara type

of the plateau. Both the coarse and finer types seem to flare very much. The simple conical type is very rare and found only in the Quichuas, when the tooth approaches the first in type, with the lingual cusp in the fourth position or the cingule.

The most remarkable feature about the second lower bicuspid in the Peruvians is the almost total absence of the tricuspid form of the occlusal face, which we usually associate with civilization and elaborate though degenerate structure. It is the type of high evolution as well as of degraded structure. The ethnic significance of the tricuspid second lower bicuspid is very interesting, but "that is another story." Suffice it to say that it is rarely found in peoples of low çulture and coarse structure, but is usually present in higher peoples, as the Europeans. In low peoples this tooth is not developed beyond the type of the first bicuspid, but unlike the first, it is more differentiated in the higher races and usually presents three cusps. It is more or less of an accompaniment of civilization. So that it was with some surprise that the absence of the three cusps was observed in the Peruvians, as some of them were highly civilized and of fine and degenerate structure. Instead of the tricuspid type, the occlusal face presented the transverse ridge usual to the first bicuspid, or next in frequency, a large crescent occupying the lingual border, but undivided by the usual groove into two cusps. A tabulated arrangement of the different types gave the following results: Fifty per cent had the strongly marked transverse ridge similar to the first bicuspid, but with the lingual cusp or crescent on the level of the buccal cusp; twenty-five per cent had the well marked crescent on the lingual border, but without the transverse ridge; ten per cent were like the first bicuspid, with the lingual cusp depressed to the third or fourth position; ten per cent were of full bicuspid type, and but five per cent were of the elevated tricuspid type. This is a remarkable showing and indicates the low stage of this tooth among the Peruvians. It shows also that some surprising things can happen in the pursuit of this study, as in other fields of which we know but little. We will need further data before we can decide definitely in regard to this feature, as well as many others in this new science.

The Molars.—The study of the molar series opens up many interesting questions and brings us face to face with some great bio-

logical problems. The path of the evolution of the human molars is so well marked out, and they bear in their forms and features so much of the history of their phylogeny, that they serve to illustrate, as few other organs do, the history of the wonderful processes of organic evolution. We find ourselves in the presence of the stupendous workings of the Master Genius of nature, and guided by the light the phylogeny of the molars furnish, we begin to see more clearly the way of a possible solution of questions that affect the destiny of the race, but again "that is another story."

The *upper first molar* in most human races is usually larger, stronger and more constant in the type of its cusps, than any of

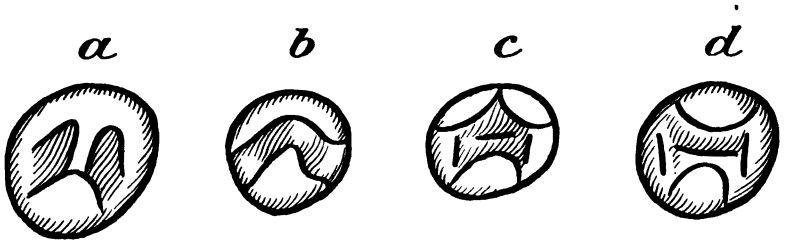


FIG. 9.

Second lower bicuspid—occlusal face. *a*. Transverse ridge form, like first bicuspid. *b*. Crescent form of lingual cusp. *c*. Tricuspid form. *d*. Bicuspid form.

the other upper molars. We are accustomed to observing this in our practice among Europeans, in whom it is very constant. It presents fewer variations and has less tendency to degeneracy of type. So in our observations of this tooth among the ancient Peruvians it was with some surprise that we found considerable variation and degeneracy of its elements. It was most constant to what we consider the normal type among the coarser peoples and most variable among the finer stock, the Quichuas, in whom there was a surprising and unexpected degeneracy. We found first that the ordinary square type of the crown was far from common, and that it often had the diamond or trapezoidal form. These departures from the normal type were caused by the reduction of the different cones of the crown. For instance, the diamond-shape would be produced by the depression of the paracone and the hypocone, the protocone and metacone being as large or larger than usual. The trapezoid would be caused, as usually happened, by the depression of

two cones in a pair, as the protocone and paracone, so that the mesial half would be less in size than the distal. Then the distal cones would be depressed, making that half smaller. This kind of deficiency of form was quite common. Sometimes the hypocone alone was reduced as in the second molar. Rarely it was totally suppressed and made a tricuspid crown. The number of these deficient first upper molars was so great as to be impressive, but they were found most largely, as before remarked, among the finer tribes.

The usual worn condition of the teeth in adults of course obliterated the finer features of the occlusal surface, so it was only in young subjects or in accidentally unworn molars that these could be made out. In these it was found that, except in the very coarse subjects, of course, the cusps were not high and sharp, but usually low and rounded, with few grooves and ridges. A few were quite wrinkled, which is a low quadrumanous type and not common in the first molars, although it is in the third. A wrinkled occlusal face indicates a declining evolution and reversion to a low type.

The fifth cusp, or hypoconule, on the lingual face was very uncommon. This supernumerary cingule is very erratic, being found in low and high races, seeming to be both a reversion and a higher evolution. Only one or two were found in several hundred skulls. We cannot yet guess what this surprising absence signifies. This is one of the many problems that we will pass on unsolved to our successors.

A conspicuous lingual groove was found on most of the first upper molars. This groove divides the two lingual lobes of the crown, and in some races, especially the lower, runs on over the neck and onto the lingual root. This was a very conspicuous feature among all Peruvians, both coarse and fine stock, and is a low characteristic, for it is a remembrance of the time when the root was divided into two fangs. It is not common in Europeans nor in any high races, but is present in most low peoples.

The crowns were usually "flaring" in form, that is, more or less bell-shape, except when worn flat on their proximate faces by interstitial wear in old subjects. The type of molar with thick neck, which occurs among Europeans, seemed to be of rare occurrence in the Peruvians.

The *second upper molar* of course presented more eccentricities of form than the first, as it is always more variable, especially in regard to the hypocone. In Europeans this element is nearly always much reduced, and is entirely absent in a number of cases as we meet them in practice. This was found to be the condition also with the Peruvians, as was to be expected, so there is not much to be presented that is very different. The coarse plateau tribes and the refined coast people exhibited little difference, so the percentages

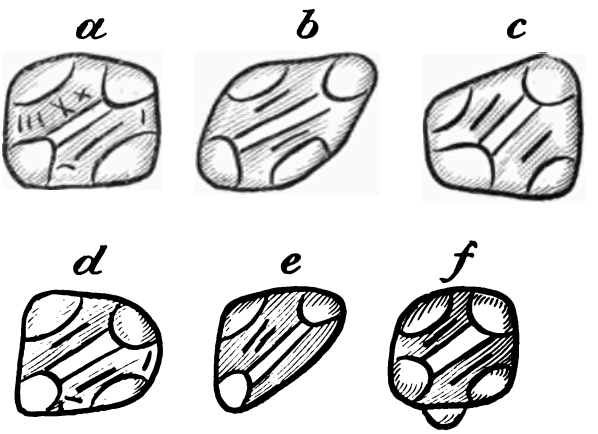


FIG. 10.

First upper molar—occlusal face. *a*. Usual square, normal form. *b*. Diamond form, paracone and hypocone reduced. *c*. Trapezoidal form, paracone and protocone reduced. *d*. Trapezoidal form, metacone and hypocone reduced. *e*. Triangular form, hypocone entirely absent. *f*. Fifth cusp, hypoconule, added to protocone lobe.

are taken together. In the former we would have expected a larger number of full, square second molars, as is common with coarse peoples, but such was not the case, the percentage with them being about the same. The general percentages of all together were as follows: Square like the first molar, the hypocone good, fifteen per cent; of trapezoid form, the hypocone reduced but not absent, forty-five per cent; of tritubercular form, the hypocone entirely absent, twenty-five per cent; metacone also reduced, six per cent; diamond-shape and other deformities constituted the remainder. This list of averages reads very much like that of an equal number

of Europeans, with quite as large a number of tritubercular and trapezoid crowns of triangular shape. Prof. Cope said years ago that this was a lemurine feature, and the reversal to that type was indicative of great degeneracy. The tritubercular molar is found away back in early geological times, even before the first appearance of the quadritubercular crown in Eocene times.

There are not many features of the upper second molar which are variable that do not depend on the presence or absence of the hypocone. The general conformation of the crown depends almost entirely upon its stage of development. Very often the metacone is reduced also, which contributes to the formation of the trapezoid. Occasionally the protocone is reduced and the hypocone enlarged, which produces the diamond form. The two distal cones are always depressed below the ordinary plane of the mesial tubercles, which is normal, but aside from this the deficiency or enlargement of the crown of this tooth is very erratic in the Peruvians. The lingual groove was not very common, except in some of the square crowns, which simulated the first molars in other respects also.

The roots of the second molar were of the three-fanged type apparently, especially in the square crowns like the first molars. In some sockets there was only a rough connate alveolus like that of the conical third molar, and often the two buccal roots were fused or the lingual and buccal would be fused, just as in Europeans.

The *lower first molars* were of great uniformity, of the usual trapezoid outline, with little variation except in size. They were very large in the plateau tribes and smaller in the others. They were more constant in form than the first upper molars and presented fewer aberrations from the usual normal type. The crowns were very flaring, of full bell-shape, spreading widely at the marginal ridge. In some coarse subjects they seemed to be of the oblong outline common to the apes and low races, but this low type was not usual. The variability of the prolongation in the rear depended largely on the position of the fifth tubercle, the hypoconulid, as to whether it was on the buccal margin or was swung round to the rear. When in the latter position the crown was more projecting in the rear.

A typical low feature was the wide sulcus on the occlusal face, the usual triangular ridge not being pronounced. This is character-

istic of the lower molars of the quadrumana, which are all alike. The triangular ridges appear later in the higher forms of the anthropoids.

Sometimes the buccal or lingual marginal ridges were cut by cross grooves, making supplemental tubercles. This variation would make six tubercles on this tooth. This peculiarity was noticed on young subjects where these teeth were unworn, and especially when not quite erupted. It was a curious reversion to the multitubercular form of the lower molars. It has occurred in other races and so has no ethnic significance.

The first lower molar was frequently the subject of destructive wear, so that the finer features were often obliterated, and the wide, worn surface presented the well-known, smooth, polished

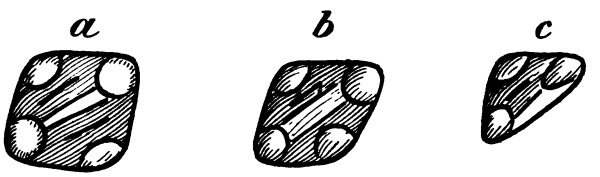


FIG. 11.

Upper second molar—occlusal face. *a*. Square form, like first. *b*. Hypocone reduced. *c*. Triangular form, hypocone entirely absent.

appearance with which we are so familiar in tobacco chewers. Probably it was often due to the same cause, i. e., the keeping and chewing of the "quid" of coca with its gritty ingredients directly over this tooth. There does not seem to have been as much interstitial wear of the lower molars as of the uppers, so that the flaring bell-shape of the crowns was always conspicuous.

The *second lower molar,* like the second upper, is rather eccentric and irregular in form in the Peruvians, quite as it usually appears in the higher races. In the apes and the lower races of mankind it has the fifth tubercle, the hypoconulid, just like the first, and is in perfect harmony with it both as regards size and shape, but in the higher races, especially the Europeans, it is typically and usually quadritubercular, having lost the hypoconulid in the process of its evolution. This is a degenerate type, but the writer has elaborated that elsewhere. (See paper on "The Phylogeny of the Fifth Tuber-

cle of the Second Lower Molar of Man," Trans. of the International Dental Congress, Paris, 1900.) The ethnic significance of this tubercle still remains to be worked out, and taken throughout all races, it would form an interesting topic for study.

Among the ancient Peruvians the degeneracy of the second lower molar was not so marked as was expected, considering the advance the people had made in culture and their consequent general degeneracy. It was found by carefully tabulated estimate that of the whole number examined seventy per cent had the fifth tubercle like the first molar; twenty-five per cent had only four tubercles, the hypoconulid being absent, and the remainder were irregular, partial fifth tubercle, etc. Destructive wear obliterated the features in some, of course. The result of the percentages arrived at was rather surprising, considering the cultural stage of the Peruvians. Of course the most molars with five were found among the coarse people, but were not confined to them by any means. The coast people, especially at Pachacamac and Ancon, had also a larger proportion of five tubercles than of the quadritubercular form. The results would show that this tooth among the ancient Peruvians of all classes had not evolved as far on the road to degeneracy as with Europeans. The significance of the fifth tubercle is of considerable importance in estimating the cultural stage of a people, and if judged by that the position of the Peruvians is still quite low.

The shape of the crown varies with the presence or absence of the fifth tubercle. When present of course the hypoconulid causes a distinct projection of the marginal ridge in the rear, but when absent the crown has a more square form and perpendicular sides, as we observe in Europeans.

In the quinquetubercular form the sulcus is usually quite wide, like the first molar, the triangular ridges being low; but with four tubercles there was the usual cruciform type of surface, the triangular ridges being well developed.

The roots bore some relation to the presence or absence of the fifth tubercle, so far as could be observed. In the quinquetubercular form they were wide and well apart, as in the first molar, but in the quadritubercular type they were more connate and closer together.

The *third molars* are more or less erratic in all races, so there is not much ethnic significance to be attached to their irregular

variations. In general they are more perfectly developed and nearer the typical form of the other molars in the lower races than in the higher. In the latter they are usually very erratic and degenerate in form and structure, but beyond this we can say but little, as no special value can be placed upon their variations. Indeed, these teeth begin to be deficient in size as compared with the other molars in the chimpanzee, but that also "is another story."

In the Peruvians we found great variation and deformity of the *upper third molar,* quite as much as among a similar number of Europeans. Of the number examined it was found that only six per cent were of full form like the other molars; forty per cent were tritubercular in form, large and small; fifteen per cent were

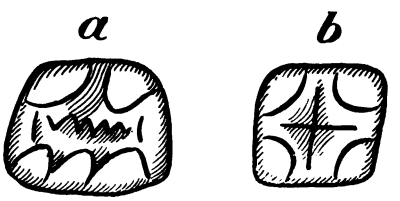


FIG. 12.

Lower second molar—occlusal face. *a.* Five cusped form of normal first molar, found (as ancestral type) as a reversion in second molar. *b.* Degenerate but usual form of quadri-cuspid type of lower second molar in higher races.

trapezoid, with four tubercles more or less irregular; ten per cent were of bicuspid form; ten per cent were totally suppressed, etc. So that the irregularity was very conspicuous and with little value as regards the ethnic significance of the variations. We can only say that they were very degenerate and indicated an advanced stage on the path toward suppression.

The *lower third molars* were generally larger than the uppers and somewhat better developed. They were not so regular in eruption, however, as they presented more cases of diverted direction and impaction. Of the number examined, five per cent were irregular in eruption and impacted, most being tipped against the second molars—some above and below were directed outward, and but very few to the inside; five per cent were totally suppressed, and of these some probably yet remained in the jaw; sixty-five per cent were full size, with four or five tubercles like the other molars; twenty

per cent were small, with four tubercles or irregular; five per cent had the wrinkled occlusal face sometimes found, which is a reversion to the form of these teeth in the orang. A small proportion had abnormally large crowns, as if an attempt to produce the fourth molar had been made and the abortion was fused to the third molar, as is sometimes distinctly observed. Altogether the lower third molars were better developed, but yet were very erratic and irregular, like those of the higher races.

In conclusion, I will offer nothing in the way of a summary, for this study has been only in the way of an experiment, with the purpose of assisting in discovering characteristics that might possibly be considered ethnic. For this purpose, however, we have not yet sufficient data and cannot have without much more extensive observations, so my work must be considered as suggestive merely and as an effort to blaze the way for more elaborate studies and investigations. My mission will have been accomplished if I shall have interested students in the subject of ethnographic odontography sufficiently to induce one here and there to take up and pursue the work among different races. Years of study and masses of material will be required before we can safely venture upon definite generalizations and deductions. I can only hope that this imperfect contribution to the great subject will stimulate the study and gathering of that material.

Discussion. *Dr. C. N. Peirce,* Philadelphia: I have been with Dr. Thompson in the study of the crania and teeth, and know the close attention he has given to the subject and the immense amount of work involved in preparing this paper. It requires much care and ability to discriminate between and fully appreciate the modifications that are taking place in the different races with regard to the teeth. I was especially interested in these particular researches of Dr. Thompson's, because after going over the crania to which I had access in the study of the third molar of the Peruvians I was surprised to find so large a proportion of these molars that were so much reduced in size. Not until after I had made this examination, and then attempted to learn something of the history of the Peruvians, did I see what I thought was the reason for the change that had taken place in these teeth. The Peruvians have been civilized for many generations, and their food, besides being cooked, has been

vegetables and fruit. I have always maintained that a vegetable and fruit diet has a marked influence in the modification of the size of the third molars, simply because less force is required in mastication. There is also greater development of the lower jaw when the tribe has lived on raw food. You will remember I stated in my paper that I found more than one-half of the third molars reduced in size, which surprised me greatly, and it was not until I had obtained the history of these people that I could see why it should be. The fact was fully explained by their civilization and food habits. For many years I have held the theory that the food habit is instrumental in modifying not only the size and prominence of the lower jaw, but also the size of the teeth. The force exercised by the muscles in mastication has a greater influence than you imagine on the molar processes as well as on the maxillary bones.

Dr. Cox: I wish simply to add one more link to this chain in regard to the Indians. The Columbia Indians are divided into various tribes, one of which is known as the Flatheads. The shape of the head is similar to that of the Incas, but the form is brought about by binding the child's head to a board, producing a sloping forehead. The number of skulls to be procured is not very great, as it is a small tribe, and almost extinct at the present time, and the habit has practically disappeared, but in those skulls that I have examined I have found, as in the Incas, absolutely no displacement of the teeth on account of the shaping of the head, also that the teeth are uniformly large and sound.

Dr. Brigham: Dr. Thompson spoke of trephining practiced among the Incas and called it a fad, but I believe it was a necessity with them, and that they were practicing what might be termed the high art of brain surgery. They probably found that in some cases the brain was injured by the pressure brought to bear upon it in the changing of the form of the skull, and that it was necessary to practice trephining in order to relieve the brain of that pressure. This would be my explanation why so many examples of trephining are found.

Dr. Thompson, closing discussion: This practice of trephining among the Peruvians is very interesting. Squier in his "Travels in Peru" says he believes that they performed the operation not only for surgical reasons but for pathological conditions. Of course it is

a question as to how much they understood about it. Trephining has extended among various savage peoples, and is practiced today by some of the tribes of the Pacific Islands. They perform the operation for very simple lesions, even for the relief of a headache. The shaman will uncover the scalp and scrape a hole in the skull with a seashell. It is something of a fad among them as a treatment for almost all kinds of diseases and disturbances. There are other matters of interest about trephining which I could not elaborate in the paper. Trephining was practiced considerably among savage tribes on dead bodies in order to secure amulets or rondells, little round pieces which were worn as charms. There is also no doubt that living victims, as prisoners, were subjected to this operation.

When reading the paper I did not have time to speak in regard to other facts which were outside its scope. I did say, however, that in my recent studies I had noticed the exceedingly small size of the bicuspids among the Mexicans, and that so far I have found the same thing true of other American tribes. This fact would seem to militate against what is called the Mongolian theory of the origin of the American races, because the bicuspids among the Mongolian tribes, and especially among the Chinese, are exceedingly large in comparison with the other teeth. There are many other things that could be brought out, but I do not want to make any generalizations or deductions as yet, because we are in want of reliable data. The microscopic anatomy of the teeth should arouse our interest, and I hope that dentists in this and foreign countries will study the subject in relation to peoples with whom they may come in contact.

SECTION V.--Continued.

Surgical Procedures in Abscess of the Maxillary Sinus.

PAPER BY J. D. PATTERSON, OF THE SECTION.

It would be presumptuous for me to endeavor to instruct the members of this body upon a subject which is dealt with in text-books on surgery and dental surgery, and in the literature of journals and society proceedings, were it not that much of what I shall say is based upon the results of practical experience with a considerable number of cases during the last thirty-five years.

The point I desire to make is, that in disease of the maxillary sinus I am opposed to the so-frequently advocated penetration of that cavity immediately above the buccal roots of the first molar through the external wall of the sinus, and the reason I address you to-day is to give the history of a recent case in my practice in support of my opposition to this surgical procedure.

As regards opening at the point indicated I will make four criticisms—First, perfect drainage sought is not obtained. Second, if a sufficient opening, necessary for exploration and treatment, is made the thin wall removed is not reformed and an objectionable cicatrix of soft tissue results. Third, the origin of the masseter muscle and the attachment of the buccinator muscle are sometimes seriously impaired. Fourth, if the opening thus made extends to the lowest level of the sinus, the buccal roots of the molar teeth which the operation seems to conserve are laid bare and placed in an undesirable condition.

The advocates of this operation, on the other hand, put forward a

very meritorious claim when they assert that an opening sufficient for drainage, for the removal of tumors and for treatment can be made through the external wall without demanding the extraction of a tooth. Let us see if their claim holds good.

Of the treatment of abscess in the maxillary sinus it is often said that a cure is readily effected by penetration of the sinus and removal of inflammatory products, and that the operation is a minor one. While this is often true in cases of short-standing, my experience shows that a large majority of cases presented are of long-standing, the patient naturally being unaware of trouble until an engorged cavity causes bulging of the walls and inflammation, and fetid pus exudes into the nasal passages.

This may have given rise to tumors of the sinus, usually of a polypoid character, often resulting in softening of the walls and necrosis, and these complications demand the most intelligent and painstaking surgical care for their cure. As in all similar pathological tracts, the first procedure is the removal of the irritant; second, the removal of all inflammatory products, the establishment of an aseptic condition, and the most perfect drainage. In this I believe the opening advocated fails in disease of the maxillary sinus.

My first objection to the operation on the external wall is, that such an opening does not establish the most perfect or the best possible drainage. The best drainage embodies ready and continuous evacuation of all exudations and pus, so that additional poisoning of the tissues is not presented. The opening upon the external wall, even if it extends to the lowest level of the sinus, would give the best drainage only with the patient in a recumbent position and with the affected side lowest. It must also be remembered that the floor of the antrum is lower on the lingual than on the buccal side, so during the greater part of the twenty-four hours the exudations and exfoliated tissue from the operation would remain and produce new irritation by putrefaction and the growth of pathogenic germs.

The second objection to this opening is, that the thin bony wall is not again formed if the opening is sufficiently large, and if it is closed finally it is with cicatricial tissue, presenting a depression sometimes noticeable upon the contour of the cheek.

The third criticism, that the masseter and buccinator muscles are injured, applies where the opening is kept patulous for a long time.

If the disease responds to treatment quickly there will be little injury, but if a large opening is made and kept open for some weeks, as is necessary in severe cases, some of the fibers of these muscles severed will not reunite, and the muscular action on the affected side will be impaired.

The fourth criticism is, that the external opening made sufficiently large down to the lowest level may lay bare tooth roots. There is

a.—NORMAL CONTOUR.

little room between the buccal roots of the molars for any considerable opening, and when the roots lie beyond the lower level of the sinus, as frequently occurs, they will be injured when the external opening is made, so that they may not return to a healthy state, for if the treatment is long continued these exposed surfaces are bathed in pus and may not regain a comfortable condition on account of destruction of the pericemental tissues. The nerves and blood vessels entering the teeth—if the teeth are vital—will also be injured,

and the teeth be devitalized when devitalization is not contemplated.

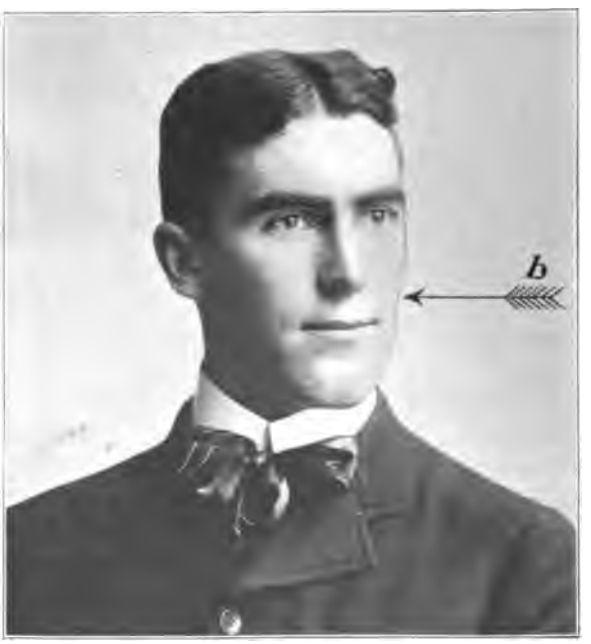
The foregoing objections are all obviated by opening into the sinus through the alveolar process from the socket of the tooth which examination determines is at the lowest level of the antrum. Notwithstanding adverse opinions upon the subject, clinical experience, as well as diligent inquiry for many years among surgeons, convinces me that inflammation of the antrum is very rarely met with as an idiopathic affection, but occurs as the result of injury, or as an extension from a diseased tooth, the tooth involved being usually the first molar, though an abscess on the bicuspids or second molar may frequently cause the irritation.

It is surely surgical sense and pathologic science to remove the abscessed tooth which causes the trouble, be it either of the teeth mentioned, and gain entrance to the maxillary sinus at that point. The diseased root may not be exactly at the lowest level, but the opening can usually be extended so as to reach that point, and it will certainly be nearer the lower level than any opening that could be made on the external wall, and will afford the most continuous drainage possible.

I will then lay down the following propositions—First, that in disease of the antrum from dental irritation the entrance to the sinus should be through the alveolus, and if possible through the socket of the affected tooth. Second, any considerable disease of the sinus from irritation other than dental is of rare occurrence. Third, if sarcoma is found in the antrum, whether from dental, traumatic, catarrhal or idiopathic irritation, the opening through the alveolar process is demanded by the best surgical science, even if a perfectly sound and useful tooth is sacrificed, because such an opening affords ready access. Continuous drainage does away with the necessity for drainage tubes, tents or stoppers. Fourth, when the disease abates the opening readily closes with new bone and leaves no objectionable cicatrix which may show a blemish on the facial contour. I have on more than one occasion found the external opening failing in effecting a cure which the lower opening through the alveolar process corrected, and also found the former presenting one or more of the aforesaid four objections.

I consider myself especially fortunate in being able to present to you the history of a recent case practically demonstrating the claims

I have made as to the inadequacy of the external opening, and showing you a photograph of the patient with an objectionable depression in the natural contour of the face, as the result of such an opening—certainly more objectionable than the loss of even a sound tooth. The history of the case is as follows: The patient, aged 22, from the age of 12 had trouble with decayed left superior first molar, inflam-



b.—DEFECTIVE CONTOUR FROM OPERATION.

mation and swelling, reaching the climax about twice each year, when the trouble would subside; noticed fetid discharge from left nostril, which was thought to be catarrh and treated as such. At the age of 18 visited a dentist who extracted the diseased molar, which gave relief for a short time only. Then went to another dentist, who removed a root left by the first operator. The trouble continued and a third dentist was consulted, who diagnosed inflammation of antrum, and an opening was made. Treatment was by syringing with antiseptics and placing a drainage tube. Patient was

treated nearly every day for six months, and tube was removed once a month. Disease continued about the same, so he visited a fourth dentist, who enlarged the opening and treated twice a week for seven months, discharge still continuing. Patient then went to a surgeon, who made an opening on the external wall, and after treatment, packing with iodoform gauze, there was no permanent result, the offensive discharge returning when treatment was discontinued. The patient then returned to the dentist to whom he had first applied for relief, and was directed to me.

I found the opening upon the external wall closed with repair tissue—no bone, and leaving a depression; a small opening into the antrum through the socket of the molar extracted, through which pus escaped, and a free discharge of pus from the nostril on left side. I enlarged the original opening through the tooth socket until it was about five lines in diameter. Examination showed the sinus filled with a fibrous growth, which was removed with curets and irrigation. In the operation a drainage tube which had been used by the third dentist was dislodged. It was of quill and was very foul-smelling. After thoroughly removing all of the tumor, irrigating with water, temperature 120 degrees, and using as an antiseptic Dobell's solution, cauterization with pure carbolic acid and packing with iodoform gauze completed the first treatment. The packing was removed in twenty-four hours, then daily antiseptic washing was kept up. At the end of a week there was considerable unpleasant discharge, so applied full strength iodin over all antrum walls, and renewed daily cleansing. Discharge gradually ceased, and at the end of eight weeks entirely stopped. The operation was performed Jan. 16, 1902. The discharge from the nose is gone, the discomfort has ceased, and the opening, which during all the treatment remained open, has entirely closed.

As the main object of the presentation has been an argument against penetrating the antrum from the external wall over the buccal roots of the teeth, I will conclude by noting two points against such operation which the case presents. First, the external opening made by the surgeon, although evidently a considerable one, did not effect a cure, even with the offending tooth long out of the way, nor even betray the presence of a poisonous drainage tube. Second, the external opening has left a facial blemish, owing to the fact that the

bone has not reformed, and the cicatricial tissue shows a depression noticeable upon the cheek. Severing the attachment of muscles mentioned may also have contributed to the objectionable result—a result, as I have said, which will not follow the loss of a tooth, even if it must be sacrificed in the operation.

Discussion. *Dr. M. L. Rhein,* New York: I believe it is impossible to handle this subject as suggested by the essayist, and the pathological conditions present in the maxillary sinus are so different in their etiological factors and in the shapes that present themselves to us that it is impossible to outline a uniform course of treatment. The varying conditions must govern the method. The case which Dr. Patterson has cited is an argument against the form of treatment which he suggests. The fact that the surgeon who operated on the external plate of the antrum failed to find the quill that was lodged therein, and was unable to remove the pathological conditions present, is no argument against the fact that the operation was the proper one at that time, but merely shows that a poor operation was performed by an incompetent operator. I cannot see how Dr. Patterson could have removed the quill, and pursued the course of treatment by means of which he cured the case, unless that portion of the external plate had been previously removed and he were able to utilize the space in removing these pathological conditions. I do not believe a radical operation for a serious condition in the maxillary sinus can be performed through the limited space afforded by the socket of a tooth. The pathological conditions found in the antrum may be divided into two general classes—acute and occurring for the first time, or chronic. In an acute condition, with the infection recent, radical operative intervention is frequently uncalled for and unnecessary, for in a large number of these cases treatment can be made through the nasal canal or irrigation through the socket of a tooth where the opening into the antrum is sufficient, and a cure be effected in that way. However, where there is a tumor, or polypoid growth, or some condition necessitating thorough curetment of the entire antrum, it seems to me impossible to effect a cure unless the whole of the antral cavity is laid bare.

Dr. W. H. G. Logan, Chicago: This paper is in direct opposition to the method set forth by me at the last annual meeting. My belief held at that time has not been changed by observation, so I must dis-

agree with the essayist. The first objection made to the buccal opening is that the perfect drainage sought is not obtained. If the buccal opening is made we are in position to explore the antrum and ascertain if the penetration is made into the sinus, a condition that sometimes cannot be determined through an opening from the alveolar process. This is proven, not by my statements, but by the casts and charts shown by Dr. Cryer in years past. The next step is to carry the opening to the lowest point of the antrum, and thorough drainage is then obtained.

To take up the second criticism, that an objectionable cicatrix of soft tissue frequently results over the buccal opening, I would say that the size of the ordinary buccal opening in the soft tissue is not greater than the aperture produced through the mucous membrane and tissue by the removal of a first molar. Furthermore, both openings close by the same process—of granulation, and the tissues are practically the same, mucous, because we have not gone into the fibrous mass of the muscles.

The third objection is that the origin of the masseter muscle and the attachment of the buccinator are sometimes seriously impaired. Eckley says—"The masseter muscle. Divisions: Superficial and deep layers. Origin: Superficial layer; lower border malar bone and anterior two-thirds of lower border of zygomatic arch." In other words, we reach the superficial but not the deep fibers. "The buccinator arises from (1) the pterygomaxillary ligament; (2) from the alveolus of the upper jaw; (3) from the alveolus of the lower jaw." We have made our opening above the alveolar process —draw your own conclusions.

In reply to the fourth objection I would say, carry the opening forward or backward and obviate the possibility of exposing the molar roots.

I entirely agree that the majority of cases which present themselves for treatment are of long standing, and that from the constant discharge from this sinus into the nasal fossa result the polypoid growths so often present. The nasal fossa has free exits for its secretions, and if a discharge of pus into it results in the proliferation of that tissue, should we not expect to find the polypoid growths from the mucous tissue lining the antrum growing more profusely, since the pus is more constantly present and the irritation is more

persistent. Clinical observation proves that when the mucous membrane of this sinus has been subjected to the irritation of suppurative and necrotic bacteria for a number of weeks, mucous tissue development in the form of polypi is a natural result. Irrigation of the antrum will reduce the size of these growths but not remove them, and so long as they remain the sinus cannot return to a normal condition. Permanent cure depends largely upon the removal of all carious bone and polypoid growths by curetment, and without it treatment cannot be thoroughly carried on. Furthermore, to know that cavity thoroughly an ocular examination should be made through the buccal opening. Finally, if sarcoma involves the maxillary bone or antrum, remove the floor and facial portion of the sinus and almost all the maxillary bone, or you will not permanently aid your patient.

Dr. R. H. Hofheinz, Rochester: One statement of Dr. Patterson's largely justifies his opinion. If I am not mistaken he said that most antral trouble was due to the teeth, and I believe that where they have caused the disturbance it is almost invariably necessary to remove the offending members, because the trouble has been of sufficiently long standing that the necrosed roots penetrate the antrum, necessitating extraction. Probably this is the main reason why Dr. Patterson advocates extraction as the best method of curing these troubles. On the other hand, during the last few years we have all observed many cases of irritation of the antrum and other sinuses as the result of the grip. Frequently antral trouble continues after the grip germs have disappeared, owing to their ptomaines remaining. Under such circumstances, where dental trouble has probably had nothing to do with the production of the irritation, would not Dr. Patterson prefer to make his buccal opening rather than to extract a tooth—at least until he has definitely decided that he is unable to effect a cure without extraction?

Dr. Thos. L. Gilmer, Chicago: The character of the operation depends entirely upon the condition present. If we have an empyema of the maxillary sinus that is caused by the septic roots of a tooth, perhaps extraction of the tooth is all that is necessary. If we have a simple engorgement which has come as a sequella to the grip, or has perhaps been transmitted through continuity of tissue from an inflamed lining of the nose to the sinus, an opening large enough to

give drainage may be all that is necessary. But if we have a prolonged empyema, which is dependent upon a general diseased condition of almost the entire lining of the wall of the sinus, extraction of a tooth or a small opening through the socket is not sufficient. If there is trouble present that cannot be cured by ordinary irrigation and slight drainage, we should have an opening sufficiently large to admit the small finger, so as to obtain the benefit of the tactile sense, and large enough that we may introduce a small electric lamp to illuminate the cavity and show its condition as treatment progresses. These aids cannot be employed in conjunction with Dr. Patterson's method, and it is impossible to curet the entire antrum with the smaller opening. It is often necessary to remove the entire lining of the walls of the antrum to effect a cure. To enter the cavity by an opening through the alveolar process, if it is made large enough for curetment, entails cutting an immense amount of the process, and is much more destructive of bone than is necessary or is occasioned if the opening be made in another way. If the patient is somewhat along in life the buccal wall of the antrum is quite thin, but at any age it is easily penetrated from this direction and in the most dependent portion of the sinus.

Another objection I would urge against the opening suggested by the essayist is the liability of food being forced into the cavity in mastication. If the opening be made on the buccal side the cheek folds over it and makes a cover which in a measure prevents the entrance of food. As to the disfigurement, I have performed the radical operation—making a large opening through the buccal wall of the cavity—very often, and have never seen a case where deformity resulted. I am therefore led to suppose that the case reported by Dr. Patterson is exceptional. Possibly the surgeon made the opening from the exterior of the face, and if so we should expect a deformity.

I do not make the opening in such a way as to interfere with the buccinator muscle. I make a horizontal incision at the duplicature of the mucous membrane and the gum, then, using a periosteotome, the soft tissues are dissected from the bone and held up out of the way in such manner that the muscle is not materially injured and certainly is not destroyed. I begin the opening with a large drill very near the alveolar process, cutting upwards, and then enlarge

with cross-cut burs, mesially, distally and upwards, sufficiently to get at the cavity in such manner that I can see into it or feel it, and thus know its condition.

Dr. T. W. Brophy, Chicago: I would not remove a tooth to secure drainage unless it were absolutely necessary to do so, as that tooth may give good service many years after complicated disease of the antrum has been cured. In recent acute cases of abscess of the antrum I have frequently perforated the wall with a very fine spear-shaped drill, carrying it through the nasal passage, and in a week the trouble would be ended. However, I would not advocate that generally, any more than I would always recommend removal of a tooth or an external opening through the buccal wall. The conditions present in each case must guide us. The X-ray does not help us in determining whether there are polypoids, carcinoma or anything of that nature in the antrum, so in severe cases we not only obtain the proper drainage but can also make an ocular and tactile examination through the buccal opening. We may have other complications that have not been mentioned, as the frontal sinus, infundibulum, ethmoidal cells, etc., may be involved, and we cannot hope to cure the majority of these cases through a tooth-socket. Some patients have been cured through tooth-sockets, and many others have suffered with antral disease for years, carrying a drainage tube and having the cavity irrigated several times a week, but all to no purpose.

Dr. J. Y. Crawford, Nashville: Take a case where a tooth pulp has been devitalized and an abscess forms and discharges into the antrum. There is merely a discharge of pus and a slight disturbance of the mucous membrane—a simple empyema, without foreign growths or any other complications. The infection will subside the moment the cause is withdrawn. In such a case I feel sure Dr. Patterson would recommend the buccal opening. I am satisfied that many antrums have been opened, explored, cureted and treated, that never got well and never will get well, where a cure might easily have been effected if such radical measures had not been adopted. Where the mucous membrane is very sensitive the daily syringing frequently tears down all that nature has accomplished. The antrum is more often over than under-treated.

Dr. G. V. I. Brown, Milwaukee: In justice to Dr. Logan I

would say that the case he operated on in Milwaukee last year recovered without any deformity of the face. The patient was under my care, so I am able to bear this testimony.

Dr. B. G. Maercklein, Milwaukee: The dentists and the surgeon who preceded Dr. Patterson absolutely failed to remove the cause of the trouble, so they had no right to expect any results. Dr. Patterson simply removed everything that caused the condition, and of course effected a cure.

As regards openings remaining after the operation, I have never been unable to close them, and in one edentulous case, where the opening was nearly two inches long, I closed it after eighteen months of constant stimulating treatment.

Dr. C. P. Pruyn, Chicago: Because in one case the opening into the antrum was made through the buccal wall and depression of the face resulted, Dr. Patterson advises us never to make such an opening, or the symmetry of the face will be lost. I think he goes altogether too far in his advice. In the case cited he states that the trouble began at twelve years of age. Now, we all know that the antrum, as well as other facial sinuses, is just developing at that age, so the real cause of the facial depression was not the opening through the buccal wall, but the arrested development of that side of the face, owing to the serious alveolar abscess. I have made a great many openings through the buccal wall into the antrum, and have never seen any perceptible sinking of the features or tendency toward asymmetry resulting therefrom.

Dr. Patterson, closing discussion: I have treated a great many cases in the last thirty-five years and have never been called upon to penetrate the antrum for any trouble like the grip, or for any idiopathic affection. In a case such as Dr. Hofheinz described, if the teeth were sound, I would treat from the nasal opening, or make a slight opening externally, but that is different from a large external opening.

SECTION V.—Continued.

Bilateral Bony Ankylosis of the Temporo-Maxillary Articulation of Traumatic Origin, and Its Surgical Treatment—With Report and Presentation of Two Cases Recently Treated by Operation.

PAPER BY DR. W. J. ROE, PHILADELPHIA.

Bony ankylosis of the temporo-maxillary articulation of traumatic origin, not complicated by the results of infection, is probably comparatively rare, and I am strongly of the opinion that it invariably results from some variety of fracture involving the bones comprising the joint. It could therefore quite properly be considered among the sequelæ of fractures of these bones. The title of this paper therefore not only excludes many other etiological factors producing fixation of the mandible, but the other forms of ankylosis with their varied degrees. Had it not been for fear of making the paper too lengthy, I should gladly have considered several forms of extra-articular ankylosis due to formation of cicatricial tissue resulting from numerous causes and their treatment, as I have had considerable experience in the treatment of the same.

In this report I hope to establish in each of the two cases to be presented the true etiology; to point out a very misleading symptom in reference to the true condition; to demonstrate a most valuable method for obtaining the true condition of the articulations, which shows whether both are involved and to what extent; the practicability of the treatment employed, the dangers to be anticipated and how to meet them.

I will now introduce my first patient, Mr. F. H. N., aged eighteen, whose history is as follows: When eight years of age he met with an accident while coasting. The sled which he and two others were

upon ran into a barbed-wire fence, and he was thrown violently against a post, striking his chin. He was unconscious for a short time, but regained consciousness while being conveyed home. He again became unconscious and remained so until the following morning, a period of about twelve hours. He had a wound about 1½

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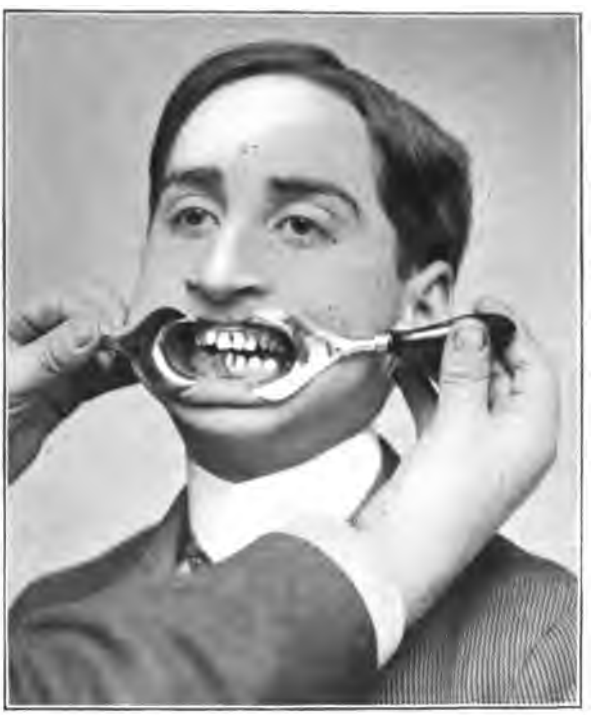
inches long beneath the chin, exposing the bone and evidently multiple fractures of the mandible. The lines of each as indicated by his parents were as follows—through the left angle, about symphysis or to the left of same, and through the middle of the right half of the body. From the history of the case and my examination I am persuaded that the location of the fractures as here given is incorrect. The wound was dressed and the mandible was

bandaged for five weeks, at the end of which time the bandages were discontinued, when, in attempting to open the mouth, it was found that ankylosis had taken place. During the following three weeks while attempts at motion were made he suffered pain in the region of the left ear, for which he consulted and received treatment from an ear specialist in Syracuse, N. Y.

About five years after this occurrence he came under the care of Dr. F., at Brooklyn, who gave him ether and forcibly opened his mouth by means of levers. This treatment was followed by the use of a screw gag three and four times daily for about three months, at the end of which time fixation was again practically complete. Two years later, Dr. G. of Utica repeated the same operation and aftertreatment, and subsequently on two occasions at intervals of two years and one year, with like results. An additional attempt was made under ether in the office of a dentist.

The patient was kindly referred to me in October last by Drs. Roy E. Jones and Joshua T. Pritchard of Remsen, N. Y. These photographs (Nos. 1 and 2), taken at that time, will show you the appearance which he presented. The noticeable features were marked recession of chin and considerable fullness in the region of each temporo-maxillary articulation. The facial measurements were as follows: From the hair line to gabella, 2½ inches; from the gabella to line of union between nose and upper lip, 2½ inches; from the latter line to point of chin, 2½ inches, and from the point of chin to line of harmony, 1⅜ inches. The mandible was firmly ankylosed, with the posterior teeth in occlusion and the anterior teeth separated some distance, as seen in the photograph. He was able voluntarily to separate the teeth in occlusion about 1-10 centimeter. Upon examining the muscles of mastication I found they were fairly well developed, evidently free from adhesions, and able to contract strongly, he having daily exercised their limited power. The size of the mandible led me to believe that development had practically ceased at the time of the injury, as it apparently was not larger than that of a boy of eight years of age. The rami formed almost right angles with the body and were decidedly more vertical than normal. There was no apparent deviation of the chin to either side, and no difference in motion, or upon examination, between either half of the mandible.

In order to ascertain whether there was any evidence of involvement of the tympanic membrane at the time of the injury or subsequently, I had his ears examined by Dr. Hoopes, otologist, who reported negatively, with present condition normal. Being still in doubt in regard to the exact position of the condyles, I was fortunate in securing these two very excellent skiagraphs (Nos. 3 and 4),



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which were taken by Dr. Charles Lester Leonard, who is a recognized expert in X-ray work. Each skiagraph shows the greatly enlarged condyle or mass of bone connecting the ramus with the temporal bone, about one-half of which is behind the posterior border of the ramus. This led me to believe that part of the original injury was a fracture through the neck of each condyle and union between the condyle and ramus at almost a right angle.

I decided to operate first upon the right side, and upon the left side about a week later, by the following method, which I will give in detail: On December 2, 1901, in the Jefferson Medical College Hospital, under ether anesthesia, I made an incision opposite the neck of condyle beginning just below the zygoma and extending downward 1¼ inches. The anterior border of the parotid gland was next retracted backward, exposing the masseter muscle. With a blunt-pointed dissector I separated the fascia and fibers of the masseter muscle and periosteum about opposite the middle of the skin incision, afterward dilating this opening with forceps until I could introduce my two index fingers. Through this opening I made a subperiosteal excision with a chisel of the mass of callus, including the condyle and neck, and found that the bridge of bone connected the outer surface of the head and neck of the condyloid process with the outer surface and lower border of the posterior portion of zygoma, and was about one-third of an inch in thickness and three-quarters of an inch in width. There was no union between the articular surfaces, and an apparent absence of the interarticular fibro-cartilage. After clearing the lower border of the zygoma and making smooth the excised border of the ramus, I was able to pass my index finger freely between the ramus and glenoid fossa, and could spring the mandible sufficiently to demonstrate that it was free upon that side, except for its muscular attachments. After carefully flushing with water to remove any chips of bone, I brought together the separated fibers of the masseter muscle and fascia with buried catgut sutures, afterwards closing the skin wound with Halstead's subcuticular suture, using silk-worm gut. (Gregg also recommends closing the wound without drainage.) The same procedure was repeated on December 9 upon the left side, and almost precisely the same condition of the articulation was found. As soon as the section through the neck of the condyle was complete, the mandible dropped a little distance. When I had completed the excision, and before closing the wound, I placed an ordinary mouth gag between the teeth and opened the mouth to about the normal extent, and then by grasping the mandible I made some lateral manipulations, after which the wound was closed.

There was no special interference with respiration during either operation and the patient made a rapid and uninterrupted recovery

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from each. The wounds healed by primary union, and in each case the sutures were removed on the eighth day. He was allowed to open his mouth as freely as the bandages would permit, and ten days after the second operation, when he left for his home, he could voluntarily separate the anterior teeth to the extent of one inch, and was learning to masticate solid food. Three weeks later he could open his mouth 1¼ inches. There was paralysis of the muscles supplied by the malar and infraorbital branches of the temporo-facial division of the seventh nerve, from which he gradually and almost completely recovered in two months. He has actively exercised the muscles connected with the mandible, and at the present time can open his mouth 1¼ inches, can close it with about as much force as the ordinary person, and has good lateral motion.

I will now introduce my second patient, Mr. E. W., aged eighteen, whose history is as follows. When five years of age he fell from a roof to the brick pavement, a distance of about fourteen feet, striking his mouth and chin. He bled profusely from his mouth and nose, and two of his upper front teeth were knocked out. Dr. Winter was called, and upon examining him found nothing wrong except injury to the teeth and gums, and after controlling the hemorrhage, ordered the application of ice bags to the sides of face. Considerable swelling took place in the region of the mandible, especially marked upon each side at site of the articulations. He was referred by Dr. Winter to Dr. Brown, dentist, who removed two other teeth that were very loose, and then fastened several lower teeth by wiring them. He was never able to open his mouth as wide after as before the fall, and a gradual decrease in the movements of the mandible was noticed, until at the end of nine months only very slight motion was possible. He applied for treatment at several hospitals in Philadelphia, and at one institution he received treatment three times each week for a period of five months, as follows—his teeth were separated as far as possible by means of a screw gag, and then a wedge of soft wood was placed between them, after which the gag was removed, leaving the wedge of wood between the teeth for three days, provided he was able to bear the pain. It being necessary to use the gag in order to remove the wedge of wood, the patient invariably returned in twenty-four hours, but occasionally endured the suffering for two days. When the wedge was removed the

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mandible could not be moved voluntarily, but would gradually close the space acquired between the teeth, and in doing so would give pain at the site of the articulations. The treatment was abandoned by the patient at the end of five months, owing to the suffering caused and the absence of relief.

He was kindly referred to me by his family physician, Dr. Heller, about fifteen months previous to the time at which I operated. After studying his case carefully, and obtaining a skiagraph with the X-ray directed horizontally (which, however, was practically useless), I asked him to wait until I could decide more definitely in regard to his condition and the method of operation to be employed. These photographs (Nos. 5 and 6), taken at that time, will show you the appearance which he presented. The noticeable features were marked recession of the chin, but no fullness in the region of each articulation. The relative displacement of the point of the chin was ⅜ of an inch below and 1⅜ inches behind its proper position according to the line of harmony, the divisions of which measured as follows—from the hair line to gabella, 2¼ in.; from the gabella to line of union between the nose and upper lip, 2¼ in.; from the latter line to the point of chin, 2⅝ in., and from the point of chin to the line of harmony, 1⅜ in. The mandible was ankylosed, with the posterior teeth in occlusion and the anterior teeth separated the distance shown in the photograph. He was able voluntarily to separate the teeth in occlusion about 3-10 centimeter. The muscles of mastication were fairly well developed, evidently free from adhesions, and able to contract strongly, he having exercised their limited power daily. The development of the mandible had evidently ceased at the time of the injury, as it apparently was not larger than that of a boy five years of age. The rami formed almost right angles with the body and were decidedly more vertical than normal. There was no apparent deviation of the chin to either side and no difference in motion, or upon examination, in either half of the mandible. I was again fortunate in securing the two skiagraphs (Nos. 7 and 8), taken by Dr. Leonard. Each skiagraph showed practically the same condition as did those of the other case, and I therefore concluded that the original injuries and the results were similar.

Having decided to employ the method used in the previous case, I operated in the Pennsylvania College of Dental Surgery, February

13, 1902, upon the right side, and found a similar condition existing, except that the dimensions of the bridge of bone were somewhat less. The details of the operation were precisely as described in case number one. The operation was uneventful, and the only point of interest, especially, in connection with future developments, was the occurrence three times of embarrassed respiration, followed

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by slight cyanoses, which disappeared upon the temporary discontinuance of the ether. This, however, did not cause any alarm or apprehension, as I had frequently seen the same condition more marked under ordinary circumstances. His convalescence was rapid and uninterrupted, and on February 20 I operated upon the left side, employing the same method, and found practically the same condition. In this as in the first operation, the ether was administered

by Dr. W. R. Roe; some slight difficulty was experienced, as noted in the first operation, and special care was therefore exercised to administer the minimum quantity by which the operation was rendered possible, and the patient was barely under the influence of ether at any time. When I completed the section through the neck of condyle, and the mandible dropped slightly, more decidedly embarrassed respiration occurred and continued to some extent while I completed the work of removing the condyle and making smooth the zygoma and upper portion of the ramus. I now apprehended some trouble, and informed my class that the difficulty which we had experienced would be greatly increased when I attempted to open the mouth widely by means of the mouth-gag, which I was about to use. I also told them that Ranke's patient had perished from failure of respiration, and that another case had been saved only by immediate tracheotomy; also now that I had the mandible completely detached, and expected to open the mouth widely, gaining access to the tongue and pharynx, I felt confident we could control the situation by ordinary means if such difficulty occurred. In this I was sadly disappointed, as you will presently see.

When I placed the mouth-gag between his teeth and separated them respiration ceased. To restore it I made rhythmical traction of the tongue, while my assistants made artificial respiration by Sylvester's method, and in addition put the patient in Trendelenburg's posture. He was given hypodermically 1-10 gr. strychnia sulphate, and we also tried different positions of the head. These means failing, I attempted to reach the epiglottis with my index finger, but in this I failed, not having sufficient separation between the teeth. Having spent probably more than a minute in these unsuccessful attempts, and the patient's condition being one of complete relaxation, with extreme cyanosis, I did a rapid laryngotomy by plunging a scalpel through the cricothyroid membrane in a vertical direction, cutting down to the cricoid cartilage. Finding this space insufficient, I extended the incision upward between the two lateral halves of the thyroid cartilage, which gave ample room to open widely the larynx, and as artificial respiration was continued the cyanosis lessened and soon natural respiration was reëstablished. Fearing that infection of the wound upon the left side might have occurred during the attempts at restoration of the patient, and as there was some

hemorrhage taking place, I packed the wound with gauze, and then closed it as in the other operations, except at the lower portion which the gauze occupied. As soon as the dressings were applied and the mandible was held in its original position with the bandage, the

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patient began to breathe partially through the mouth and nose. I had ready a tracheotomy tube to introduce if I found it necessary to keep the laryngotomy wound open. I closed the laryngotomy wound one hour after making, as he was breathing naturally, and there seemed no further use for the artificial opening. In closing it I

placed three sutures in the skin, allowing the lateral cartilages and cricothyroid membrane to approximate, as they readily did, placing a gauze drain between the same and the skin, and coming out at the lower angle of the wound. He made an uninterrupted recovery without a single dose of medicine, and the only thing he complained of was some swelling of the tongue (the result of the application of the forceps) and insomnia. The gauze drain in the laryngotomy wound was removed in two days, the sutures in five days, and on the eighth day the wound was entirely healed. The packing was removed from the left articulation on the third day, the suture on the eighth, and the wound was entirely healed on the twelfth day, no infection having taken place.

In the first case, while the patient was under ether, I had the opportunity of opening the mouth widely by stretching the muscles and fascia connecting the mandible and was able to make it readily moveable. In the second case I had just begun a similar procedure, and had only opened the mouth about half-way when suspended respiration occurred. I afterwards regretted not having completed this procedure while the patient was breathing through the laryngotomy wound, as I could have done so then with safety. Fearing a repetition of interference with respiration if I gave him an anesthetic to complete the opening of the mouth, I began the use of the mouth-gag twelve days after the operation. This point was of extreme interest to me, for each method had its advantages and disadvantages. In the first case the overstretching of the muscles so long contracted would necessarily result in strain and laceration of some of their fibers, and thus result in weakening the muscles and the cicatricial contraction in healing would also lessen their ultimate functional power. In the second case, although believing that the slight stretching of the muscles was free from the dangers incident to the overstretching of the same, and promised better development, I feared I could not overcome the resistance of the fascia and secure a sufficient range of motion to the mandible. The mouth gag was used at intervals of two and three days and then only with very moderate force, owing to the fact that slight pressure upon the teeth would cause considerable pain, as the tissues of the alveoli had never been accustomed to resisting pressure, as in mastication.

Considering both cases carefully, I think the results are just as

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good in the second as in the first. Paralysis of the same group of muscles as occurred in the first case was present in the second, but it had entirely disappeared at the end of two months. The laryngotomy was followed by some functional disturbances, such as slight hoarseness and inability to speak loud, from both of which patient has entirely recovered.

The first thing I hope to establish in this report is the true etiology in each of the two cases, believing, as I do, that ankylosis resulted from fractures through the neck of the condyloid processes, for the following reasons: Fracture of the neck of the condyle is not as infrequent as is generally supposed. In forty-one cases of fracture of the mandible which we (Dr. W. R. Roe and myself) have treated, the line of fracture in six cases, two of which had multiple fractures, was through the neck of one condyle, and in one through the neck of both condyles. The displacement at site of fracture in each and all of these cases was forward and upward, bringing the fragments closer to or in contact with the lower border of the posterior portion of the zygoma. If the sharp ends of the fragments are in contact with the zygoma, they may have denuded the same of its periosteum at the time of the injury; or if the fragments are not in contact with the zygoma, but are nearer the same than if they were held in their proper relation to each other, and not completely immobilized, the irregular masses of callus which will form in the process of repair will frequently reach the lower border of the zygoma and mechanically denude the same of its periosteum. This I hope will explain the gradual and frequently slow occurrence of bony ankylosis in a number of reported cases. The skiagraphs in each case show clearly the angular displacement upward and forward of the neck of the condyle. This, in connection with the more vertical position of the posterior border of the rami, together with the separation of the anterior teeth, and the posterior teeth in occlusion, tallies accurately with the conditions which would result from such fractures. The delineation of the skiagraphs was verified at the time of operation, and the bridge of bone corresponded to this situation.

The very misleading symptom with reference to the true condition to which I alluded was the ability to move the mandible 1-10 centimeter in the first case, and 3-10 in the second, which might have

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been taken by some to mean that with true bony ankylosis no motion, however slight, could occur. Cabot first called attention to this and said it was due to springing of the bone. In both of my cases it certainly was due to this cause. These skiagraphs demonstrate a most valuable method for obtaining the true condition of the articulation, and they also show whether both articulations are involved and to what extent. The negative is placed against the side of the head, and the tube is adjusted so that the rays pass through the articulation in an oblique upward direction, in this way avoiding the opposite ramus and angle, the shadow of which would not be as clearly defined as the ramus, which is in close contact with the negative.

As regards the practicability of the treatment employed, I still consider it preferable to operate only upon one side at a time, and first upon the side most involved. Both articulations could be operated upon consecutively during the same operation. The advantages of this would be that the operator could satisfy himself while the wounds were still open that sufficient bone had been removed to obtain freedom of movement; the necessity of the second etherization avoided, and possibly a lessened period of convalescence. Against this, however, is the increased danger from shock by prolonging the operation to just twice the length of time, as it is practically impossible to do synchronous operations; also the great danger of infecting the first wound, as it is very difficult to keep it protected from the fluids escaping from the mouth, with the head turned to that side while operating upon the opposite articulation. The wound in one week would be sufficiently healed to obviate the danger of infection.

The results in these cases depend largely upon the preservation of the function of the muscles of mastication, and I think it important not to cut through the masseter muscles by a horizontal incision below the zygoma, as many operators have done. The method which I have described to you of a vertical incision 1¼ inches through the skin only, and then splitting the fascia and fibers of the masseter muscles and periosteum, does not in my opinion weaken the muscles to any appreciable extent. If the incision is limited to the skin, it is not possible to injure Stenson's duct or the temporo-facial branches of the facial nerve. I believe the temporary paralysis in each case was the result of overstretching the nerves. By means of

special retractors this method gives sufficient room for thorough and careful work. The function of the external pterygoid is necessarily lost. Considerable lateral motion has been observed in many cases of unilateral ankylosis operated upon, due to the action of the opposite external pterygoid; but in bilateral cases lateral motion is probably entirely lost.

I greatly prefer closing the wounds without drainage, as the facial contour is better preserved, especially if the muscles and fascia are held together by buried sutures. There is always considerable danger of the wound becoming infected subsequently when drainage is employed, and it is of the greatest importance to prevent infection, not only on account of the immediate danger of the same, but from the ultimate formation of a much greater quantity of cicatricial tissue, which would greatly limit the functional results; also a depression inevitably results when drainage is employed. Some have packed the articulation with gauze for the purpose of keeping the surfaces of the bone more widely separated. When the wound is closed the empty space will become distended with blood clot, which will to some extent serve the same purpose, and if a wider separation of the false joints is desired, I would rather employ the method suggested by Cabot, of placing wedges of cork between the posterior teeth to maintain separation. Although I did not employ this method, I believe it has special advantages and should be used when practicable.

The most important question of all is the consideration of the dangers to be anticipated and how to meet them. I quite agree with Ranke, who said the greatest danger is from asphyxia, and I heartily sympathize with any operator who is confronted with this difficulty. In studying these two cases I have endeavored to explain the occurrence of this condition in so serious a form in one and to no appreciable extent in the other. The ages of the patients were practically the same, they were both in fair general physical condition, and the same care and technique were employed with each. I will give you the following reasons for believing that this occurrence is dependent upon mechanical conditions, and hope that they may be of some help in anticipating its occurrence in the future. The normal position and function of the larynx is dependent upon the muscles which suspend it, the anterior group of which are connected with the

mandible. I consider it reasonable to infer that the earlier in adolescence development of the mandible ceases, the more abnormal will be the position of the tongue and larynx. In consequence of the mandible maintaining a fixed position in relation to the head while ankylosed, the muscles connecting the hyoid bone, the tongue and epiglottis with the mandible are accustomed to perform their functions with a limited power of contractibility. If the mandible is dropped to a very slight extent you can readily see how the functions of these muscles would be greatly disturbed. The relative difference in my two patients is quite marked and easily demonstrated. The first was eight years of age when the injury occurred, and the second five, and although the subsequent development of the mandible practically ceased, the three years difference in the ages of the patients at the time of the injury has made a marked difference in the conditions of each. In the skiagraphs of the first patient the position of the head in relation to the cervical vertebra is about normal, the lower border of the mandible making an angle with the bodies of the vertebra five degrees less than a right angle, and the hyoid bone is shown one centimeter below the border of the mandible. The skiagraphs in the second case show considerable extension of the head upon the cervical vertebra, an angle of five degrees greater than a right angle, and the hyoid bone is seen three centimeters below the lower border of the mandible. The position of the hyoid bone is two centimeters lower in its relation to the mandible in the second case than in the first. The displacement of the larynx, hyoid bone and base of tongue can be approximately estimated by the following measurements: There are 1½ inches of trachea above the manubrium, which can be increased on extension to 1¾ inches; in an adult there should be an average of 2¾ inches; at ten years of age there should be 2¼, and at six about two inches. The cricoid cartilage is opposite the body of the seventh cervical vertebra instead of the sixth. Therefore it is a reasonable calculation, that the position of the base of the tongue, hyoid bone and larynx is one inch lower than it normally should be, and their position remains practically the same in their relation to the manubrium as it was when the injury occurred at five years of age. I believe there are two factors, both dependent upon the arrested development of the mandible, to which the faulty position of these organs is due. The

position of the larynx and base of tongue is dependent upon the position of the hyoid bone, it being suspended from the base of the skull by a duplicate set of muscles, namely, the stylohyoid, the posterior belly of the digastric, and the middle constrictor of the pharynx; and from the mandible by the geniohyoid, the mylohyoid and a portion of the geniohyoglossus, and the anterior belly of the digastric. We will recall the fact that the position of the chin is .1⅜ inches posterior to the position it normally should occupy, therefore I believe that if the chin could be carried forward to its normal position the anterior group of muscles acting from that point would raise the hyoid bone at least one inch, which would be its normal position. And of still greater importance is this, that it would not only raise the hyoid bone, but would carry it forward, and with it the base of the tongue and larynx would be carried away from the posterior pharyngeal wall. The importance of this as regards the function of these organs you will readily appreciate. I have gone into these details in order to explain to you, in the present condition of the patient, that the hyoid bone, with the organs dependent upon it for their position, are not only displaced downward to the extent already given, but they are displaced backward, leaving practically very little pharyngeal space, and when the mandible is lowered to a very slight extent the base of the tongue and the posterior surface of the larynx lie in apposition to the posterior pharyngeal wall, and while in this position respiration is very difficult. I have frequently demonstrated this fact by retaining the mandible in a depressed position by means of the mouth-gag, when the patient would become partly cyanosed and make violent efforts at respiration. At first I was inclined to believe that the obstruction to respiration was due to closure of the glottis by the epiglottis, the control of which having been lost by the changed position of the hyoid bone, as the movements of the epiglottis are practically dependent upon the position of the same. It would be folly on my part to attempt to exclude this as a factor, but I am strongly of the belief that the obstruction to respiration is due to the crowding of the larynx and base of tongue against the posterior pharyngeal wall, leaving no space for air to reach the glottis, and as a natural consequence the epiglottis would be forced against the glottis. In favor of these ideas are the following observations made at the time of operation—the respiration did

not become impeded until the mandible was completely detached, and as a consequence dropped one-quarter of an inch, and it was not entirely impeded until I depressed the mandible about one-half inch by means of the mouth-gag; traction upon the tongue with the mandible depressed was of no avail, neither could it be while the base of the tongue was crowded against the pharyngeal wall.

How are we to anticipate the danger of asphyxia in any special case before operation? The first practical point would be the age at which ankylosis occurred and development of the mandible ceased. But that in itself would have little significance if the operation were done soon after the above occurrence, as the displacement of the hyoid bone, base of tongue and larynx evidently increases with growth, reaching its maximum at adult life. Consequently, I consider the danger of asphyxia would increase in proportion to the time intervening between the occurrence of the ankylosis with arrested development and maturity. Further, I believe that ankylosis occurring after maturity would not cause any displacement or abnormality of the organs of the larynx, hyoid bone and tongue, and consequently there would be no more danger of asphyxia than ordinarily.

Upon this important point I consulted by letter the recognized authority, Dr. Thomas Dwight, Professor of Anatomy, Harvard Medical School, whose recent very valuable contribution upon the "Growth of the Face and Especially the Pharynx" bears directly upon this subject. I quote the following from his reply: "I am quite of your opinion that the very serious danger in your case was caused by the tongue (carrying the epiglottis with it) falling back and obliterating the pharyngeal space. I think it is not generally recognized how very small that space is under any circumstances, as is well shown on frozen sections in the median line. Very probably in your patient the space was even smaller than usual. I cannot, however, agree with you concerning one point. You suggest that the want of development of the mandible was the cause why the hyoid was not carried up to its normal position. The fact is, that in the infant the hyoid and larynx are very high and gradually descend, and for that matter the lower jaw descends too, for at birth its lower border is nearly in the same horizontal plane as the occiput. Consequently its function is not to pull the hyoid up. The uncom-

monly low position of the hyoid is a puzzle. So far as I know it must be extremely rare. Can it be that the want of development of the jaw in some way failed to restrain its descent? I own I do not see how this should occur. I am sorry that this is all I can say."

I would answer the above question in the affirmative, believing that it is the proper solution. As already described, the bringing closer together of the occipital and mandibular attachments of the muscles, which suspend the hyoid bone allows the muscles to assume an almost vertical instead of an almost horizontal position. Again, the growth of the tongue would necessarily displace the hyoid bone downward, owing to the fact that it could not extend anteriorly on account of the teeth in the ankylosed and undeveloped mandible, the external measurements of which are as follows—between angles, 9½ centimeters; between angle and symphysis, 7 1-10 centimeters; between angle and zygoma, 4½ centimeters. Therefore not only the antero-posterior measurement, but the lateral measurement, was lessened, which, with the inward displacement of the teeth, would greatly restrict the space normally occupied by the tongue. My attention was called to this lateral narrowing of the pharyngeal cavity by Professor E. Braden Kyle, who made an examination of the pharyngeal space and coincided with my views as regards the cause of asphyxia.

Having considered the age of the patient and its significance, a carefully elicited clinical history will aid materially in anticipating the danger of asphyxia. In case number two ordinary respiration was attended by considerable stertor, and during the entire period in which the mandible was ankylosed he was never known to sleep without snoring loudly. To secure sleep he would generally assume the prone position, with the head turned to one side and extended over a pillow, or, if in a supine position, he would place one or two pillows beneath his shoulders, thus placing the head in full extension. In each of these positions he accomplished what Dr. Howard of London claimed, that "the best way to raise the epiglottis is not by pulling the tongue forward but by extending the head and neck."

The necessity for full extension of the head during these years explains the acquired faulty position of the same with the vertebra, as shown in the skiagraph, and as already described, together with

a marked prominence or anterior projection of the bodies of the second and third cervical vertebra, against which the soft palate is closely drawn.

Having considered at some length the dangers to be anticipated, the question of how to meet the same is of the greatest importance. Where the danger of asphyxia is threatened and imminent the practical necessity of the use of the mouth-gag during the anesthesia is, in my opinion, not sustained by the results in these two cases, as the result in the second case is quite satisfactory and equally as good as in the first case, and demonstrates the practicability of obtaining sufficient stretching of the muscles and fascia subsequent to the operation. In any case where more active use of the mouth-gag is required I would recommend the use of metal shields to cover the teeth, permitting greater force to be applied, as originally recommended by Dr. Goodwillie of New York.

To relieve asphyxia when present, instead of attempting to further depress the mandible, to make traction upon the tongue, or reach the epiglottis as I did in my case, I would restore the mandible to its ankylosed position, believing that by doing so it would place the organs in the best possible condition to facilitate respiration. In addition, if necessary, I would hook a tenaculum under the hyoid bone and lift it away from the posterior pharyngeal wall. This means failing, I would then do a quick laryngotomy. The low position of the hyoid bone, and the correspondingly small amount of trachea above the manubrium, would have rendered in my case a tracheotomy both difficult and dangerous, and hardly practicable in such an emergency. It is scarcely necessary to state that in conjunction with different means employed, artificial respiration should be continued, and other aids as indicated.

The clinical history of case number two would be incomplete without giving briefly the condition of the mouth, nose and throat when, subsequent to the operation, examination of the same was made. Besides several cavities in the remaining teeth, the four first molars were so badly decayed that practically only the roots remained, and these were extracted about three weeks after the operation. The second lower molars were opposite to the anterior angle, and were in a horizontal position, the crowns looking inward and towards each other. These teeth were so far within the arch that I had not been

able to determine the presence of them until after the mouth was opened. For the care of his nose and throat he consulted Dr. Walter J. Freeman, who very kindly sent me the following report of the condition which he found: "After your operation * * * I found his difficulty in breathing due to adenoids and relaxation of the soft palate. The velum lay on the back of the tongue, and the uvula was so broad that the faucial opening was almost completely shut off from the throat. View of the vault could not be obtained through the throat, but the obstructing mass of pharyngeal tonsil could be plainly recognized through the nasal fossæ. I amputated the uvula, and the noisy respiration was immediately improved. With a snare I then removed a mass of the adenoids through the nose, and operations on this were continued by my associate, Dr. Baldwin, until the vault was completely cleared. Since that time I have not seen the patient, but trust the improvement I then saw has continued."

As regards the cause of the arrested development of the ankylosed mandible, I am unable to offer any explanation, but take pleasure in referring to the opinion of Dr. M. H. Cryer, expressed in his "Studies of the Internal Anatomy of the Face," and to the interesting illustrations therein, which correspond in detail to these skiagraphs and show very accurately the typical-shaped ankylosed mandible.

What prophylactic measures can be used to prevent possible ankylosis in cases of severe injury to the mandible, similar to the two cases here reported? A careful examination of the mandible in the regions of the articulations will frequently disclose a fracture which, when present, should invariably be treated with an interdental splint with a closed bite, or the application of Dr. Angle's system of treating fractures with the teeth in occlusion. By doing so the fragments will be maintained in their proper relation to each other and be carried away from the zygoma, practically obviating the danger of ankylosis. In my seven cases so treated there was no appreciable interference with the movement of the mandible.

Having reviewed and abstracted the literature upon all forms of ankylosis of the mandible, I find it too exhaustive to include in this paper, and will but briefly allude to a few questions of special importance. Of all the operations and methods resorted to in the past for permanent ankylosis of the mandible only two are now being

generally employed. Excision of the head and neck of the condyle was first performed by Professor Humphry of Cambridge in 1856, for the relief of ankylosis due to chronic rheumatic arthritis. The other operation is known as Esmarch's, who suggested it at the Congress of Gottingen in 1855, and it was first successfully performed by Dr. Wilms in 1858. It consists in establishing a false joint in front of existing cicatricial tissue.

I cannot agree with David M. Gregg (*Practitioner,* December, 1899), who says, "The only operation worth considering is excision of the neck and condyle;" nor can I agree with the conclusion of Dr. Paul Swain (*Lancet,* July 28, 1894), "Taking, therefore, into consideration the simplicity of the operation as compared with excision of the condyle, and the superiority of the results, I think it may fairly be suggested that the modification of Esmarch's operation is the one which surgeons in the future should prefer." I do, however, practically agree with the opinion expressed by Dr. A. C. Cabot (*Lancet,* August 7, 1897), "In cicatricial contraction due to noma, burns or lupoid inflammation, the section of the bone must be in front of the cicatrix, forming a false joint in front of the detaining bands, Esmarch's operation producing the best mechanical condition possible. In bony ankylosis the nearer the section is made to the joint the nearer do the conditions simulate the normal."

The condition of the articulation and the surrounding tissue is, in my opinion, the proper guide in deciding which operation to employ. In the absence of cicatricial tissue, as in my two cases, or when present in such quantities that there is a reasonable assurance that it can be overcome by appropriate treatment, I believe in excision of the head and neck of condyle. Where the muscles are destroyed, or their function is held in abeyance by dense cicatricial tissue which cannot be overcome, I believe that Esmarch's operation is clearly indicated and offers the best results. The preservation of the maximum amount of musclar function in bilateral cases is of the greatest importance. In unilateral cases it is quite possible to have good masticating power from the muscles of the uninvolved side, even if Esmarch's operation is done upon the opposite side and in front of the masseter and internal pterygoid. But when Esmarch's operation is done in bilateral ankylosis the power of mastication is very feeble or lost, and in one case reported the central portion of

the mandible was so beyond the control of the elevator muscles that for two days after the operation it caused grave danger of asphyxia by its depressed condition.

Of considerable concern to me was the question whether new bone would form from the periosteum after excision of the head and neck of condyle, which would subsequently lessen the range of motion. The results in these two cases and in others reported demonstrate that this danger is scarcely to be apprehended, and that it is quite expedient to make a subperiosteal excision.

Discussion. *Dr. C. N. Peirce,* Philadelphia: How did these young men feed themselves?

Dr. Roe: In both cases they placed their food between the lips with a fork, and then with the index fingers forced the food through between the teeth, especially in front where the latter were not in occlusion. It usually took the second patient about an hour and a half for a meal.

Dr. M. H. Cryer, Philadelphia: I heartily approve Dr. Roe's operations, and do not see what else could have been done than removal of the condyloid process as near as possible to the original fracture or injury. If there should be any interference here, either by the masseter or by the internal pterygoid, then it would be preferable to make a short and false joint anterior to those fibrous attachments. In removing the head of the condyle we get below the insertion of the external pterygoid, and that is why in both Dr. Roe's patients, in one in particular, a certain amount of lateral movement was lost. Of course, we understand that it is the external pterygoid which gives the greatest amount of movement to the jaw laterally, rocking it from one side to the other, as in the ruminant animals when chewing cud. There is a possibility of some of the fibers becoming attached to the mandible below the point of excision. We might in this way have motion from the external pterygoid. I believe it was stated that the second patient had had no lateral motion. It is possible to secure lateral motion from even the masseter, as it has two heads, or rather, the muscular fibers run in two directions. If the first patient will practice moving his jaws from one side to the other I believe the masseter muscle will eventually give him considerable lateral motion.

I differ with nearly all teachers in regard to the function of the

epiglottis, as I do not think that it ever closes over the glottis either in pathological or physiological conditions. In my opinion it has nothing to do with the glottis, but is there as a separate organ. In experimenting with various animals I have cut away the ramus of the jaw to facilitate observation, and have then tried to tease the epiglottis over the glottis, but have never succeeded in so doing. If I passed water from a syringe over the glottis it would close independently. The folds would close over, but the epiglottis never showed an attempt to close over and protect the glottis. I removed the epiglottis from quite a number of cats and dogs, and allowed the animals to get well, and the function of the glottis was never affected. Therefore I do not think that in the falling back of the tongue the epiglottis ever causes asphyxia. In Dr. Roe's second patient the asphyxia was due to the falling back of the hyoid bone, along with the base of the tongue, which then came in contact with the posterior wall of the pharynx. I have numerous slides which will uphold Dr. Roe's statement that this space is very narrow. The tongue naturally fills the mouth and a great portion of the pharynx. We see this space when the mouth is opened, but when it is closed the tongue occupies the space from the teeth back to the posterior pharyngeal wall or nearly so. The roof of the mouth really includes the soft palate and the uvula, and the latter comes into close relation to the posterior wall of the pharynx. The slides which I will show tomorrow evening will demonstrate this point very well.

Dr. G. V. I. Brown, Milwaukee: I have here a flexible dummy, by which I hope to show why it is that through any affection of the lower jaw we have malformations of the associated parts. With my paper and illustrations I hope to make it clear why the hyoid bone was lower, and why the other parts were in such condition that threatened asphyxia was one of the great difficulties of the operation.

Dr. J. D. Patterson, Kansas City: There is a very practical lesson in Dr. Roe's paper, namely, that in all cases of fracture there is danger of injury at the condyloid or coronoid processes, and when in reducing the fracture we hold the jaws immovable with a fixed splint, after it has been worn a short time we should take it off and give movement to the jaws, doing this two or three times during the healing, in order to forestall the possibility of ankylosis.

Dr. T. W. Brophy, Chicago: About a year ago Dr. DeSund of

Vienna advocated the use of paraffin in many places, especially where we wish to preserve the contour and rotundity of the parts and to take the place of lost sections of bone. Dr. Beck of Chicago has recently employed paraffin in such cases, and for the purpose of lifting up and overcoming the depressions following operations and the removal of cicatricial tissue. Dr. Roe speaks of the blood clots serving a good purpose in his cases, but I think paraffin could be used to better advantage, and there would be no filling in of material which would produce bone.

Dr. M. L. Rhein, New York: At the present time in the first case the only occlusion is with the very back teeth, and after the magnificent technique displayed by Dr. Roe in getting rid of the ankylosis, and the excellent result of his work, it does seem that some steps should be taken to obtain a better general occlusion.

The patient has been examined by us all, and while lateral motion is undoubtedly present, it seems to me, after a careful examination, that it is produced entirely by an acquired use of the masseter muscle and not from the pterygoid muscle at all. Dr. Cryer has examined the patient since he spoke and I would ask his opinion.

Dr. M. I. Schamberg, Philadelphia: Dr. Roe does not endeavor to explain why the hyoid bone falls when the normal articulation is reestablished. I judge it to be due to the pulling of the sternothyroid and omohyoid muscles when the jaw is released by operation, for it is a well known fact that these, together with the other auxiliary muscles of mastication, are unusually well developed in ankylosis. Dr. Cryer recently published photographs of a patient suffering from ankylosis in which the auxiliary muscles of mastication were shown to be in a state of contraction during an effort to open the mouth. I believe that if a ligature were passed through the floor of the mouth directly in the median line, and immediately in back of and closely hugging the mandible, the dropping of the hyoid bone against the posterior wall of the pharynx would be averted. This method would be similar to the one in which a ligature is passed through the tongue to prevent its being swallowed during operations about the mouth. Anterior traction applied to the jaw by means of the ligature passed around it would pull the hyoid bone forward through the medium of the geniohyoid and the geniohyoglossus muscles, thus obviating the possible necessity for a tracheotomy.

Dr. J. Y. Crawford, Nashville: Dr. Cryer's reference to the normal mouth in a closed condition not being a cavity, but being filled up with tongue, teeth, mucous membrane, etc., is a valuable suggestion.

The region involved in the production of this ankylosis is not such a dangerous territory as supposed, for nature helps along mightily. Sixteen months ago I had charge of a pathological fracture of the lower jaw which resulted in the loss of the body to the point of the first molar, back to the angle, from the angle to the ramus, to the condyle, and its complete removal. I had to fracture it at three different points, and I never found the coronoid process. Nevertheless, it is almost impossible at the present time to observe any deficiency on that side of the face, and the patient seemingly has quite as much strength on that side as on the other.

Dr. J. Taft, Ann Arbor: The statement is frequently made that the general surgeon knows nothing of oral surgery, but there is so much in medical and surgical practice of which the dentist knows little or nothing that it behooves him not to boast or make invidious comparisons. There is a just appreciation in the surgical world of what the dental profession does in these cases of oral surgery, and we cannot afford to be less generous or just. It is for the interest of all concerned that the most harmonious relations should exist between the physician, general surgeon and dentist.

Dr. S. W. Foster, Nashville: For the past four weeks I have had a case covering the point which Dr. Patterson brings up. The patient fell from a moving train eleven weeks ago and suffered a compound fracture of the inferior maxilla just above the lower border of the ramus, also near the symphysis, and posterior to the first bicuspid, with dislocation of the left zygoma. He was treated for seven weeks without securing union of the anterior fracture, but the dislocation was reduced. Four weeks ago he came into my hands. A skiagraph disclosed a union of the jaw at the ramus, showing that in articulating the parts the jaw was slipped backwards. On investigation I found that there was an anterior occlusion before the fracture occurred, so as far as approximation was concerned the teeth were in better shape after the injury than before, with the exception that in getting this union with the slipping back of the jaw there was an occlusion of the third molars only. The incisors lacked at

least three-eighths of an inch of being in contact. Ankylosis was developing rapidly, the patient not being able to open his mouth more than half an inch. Under the circumstances the question was, how we should approximate the fracture near the symphysis and also prevent complete ankylosis. Believing, as Dr. Patterson suggested, that bringing the jaws in contact with a fixed splint would produce ankylosis about as soon as a union, I decided to use bands and bars, which I consider the only rational method. We approximated the broken parts and placed them in such a position that they could not move, but at the same time did not bandage the jaws, leaving them perfect movement. Owing to the shortening of these muscles the lack of occlusion had to be overcome. By the use of the ordinary cap and chin rest with strong elastic pressure we produced an appliance which the patient wore at night, but we gave him free use of his jaw during the day. At the present time there is apparently perfect union of the fracture, the teeth having been brought into almost normal occlusion, and the ankylosis has been virtually overcome.

Dr. Cryer: After examining this patient I would say in reply to Dr. Rhein that the most of the lateral motion of the jaw is produced by the masseter muscle. I believe I can feel a contraction first of its anterior and then of its posterior portion. Of course there are other muscles assisting—even the superior and middle constrictor muscles of the pharynx have fibers connected with the pterygomandibular ligament, and all the muscles associated with the mandible would have a slight effect.

Dr. Roe, closing discussion: I consider Dr. Patterson's suggestion of great importance. In general surgery passive motion is made at intervals after ten to fourteen days to prevent the possible ankylosis from the union of the callus between the two articulating surfaces. The point to which Dr. Rhein refers is of great importance. The occlusion in both cases is through the posterior teeth, the anterior being separated. The occlusion now is just as it was before the operation. I feared that when I removed the head and neck of the bone, the temporal, internal pterygoid and masseter muscles would draw up the ramus, and tip the point of the chin further down, interfering with the occlusion of the anterior teeth, and cause an additional deformity and lack of function. I am happy to say that this has not occurred, and in both cases the anterior teeth are as near oc-

cluding as they were previous to the operation. With reference to improving the occlusion, I do not see any plan which would be efficient except sectioning the mandible about the angle, or a little in front of the angle and back of the teeth, placing the teeth in the corrected occlusion and securing union in that position. This I did in a case last winter where the occlusion of the anterior teeth was extremely faulty, due to the displacement of the fragments following a multiple fracture. The case presented three fractures and had been treated with an open-bite splint. Union had occurred where the fragments were separated, and the result was a faulty occlusion of half an inch. I sectioned the bone in three places, in one taking out half an inch, in the second a quarter of an inch, and in the third simply sectioning it. The occlusion was corrected and maintained while the case was treated with a closed-bite splint, leading to a very satisfactory result.

SECTION V.—Continued.

The Pathogenesis of the Lower Jaw.

PAPER BY G. V. I. BROWN, OF THE SECTION.

It is a primary law of nature that the forces which build and support all things, animate and inanimate, those which are constructive, may in turn become destructive elements. Thus in human life, cells active in cooperation with tissue repair, under pathologic conditions become disorganizing factors, active in the liquefaction of tissue. Irritation, that is essential for normal cell function, becomes in turn responsible for disease and its varied symptoms. Exercise and proper muscular action, all important to bodily health and to those metabolic changes upon which structural development depends, if carried to an extreme, are conducive to exhaustion, resulting in extensive tissue waste and loss of substance; or through perverted action they may become responsible for deviation of form, resulting in more or less deformity, instead of the symmetrical development which depends upon the equalization and proper direction of muscular strain.

The same principles, as applied to osseous development of the individual, are so elementary as to need no further reference at this time, and for the same reason it is unnecessary to continue, as might be done almost indefinitely, different illustrations of the truth of this maxim, which, applied directly to the lower jaw and the nervous and muscular mechanism by which it is operated, would warrant the following premises: *First.* The lower jaw is chiefly responsible for symmetrical facial development. *Second.* Perversion of its action must result in both facial and nasal asymmetry. *Third.* Antagonistic effort, resulting in normal occlusion, is the chief element in preserving the healthfulness and extending the usefulness of dental organs and oral tissues. *Fourth.* Interference, leading to

malocclusion, want of occlusion or excessive occlusion, leads directly to diseases resulting in tendency to dental caries, pericemental and alveolar diseases, shortens the period of dental usefulness and causes both local and general diseases of the nerve structures and nervous system. *Fifth.* Upon proper direction of occlusal force depends regularity of the dental arch. It is the guiding influence during the eruption of teeth to bring them into proper place. *Sixth.* Misdirection of this energy forces them out of line and increases the irregularity. *Seventh.* In cases of hare-lip and cleft palate deformity, the fissures are widened and the intermaxillary bone forced outward and forward, thus increasing the deformity and militating against this correction. *Eighth.* By undue stimulation of the central nervous system, through peripheral irritation, neuroses result much more frequently than is commonly supposed.

At birth the lower jaw is considerably larger than the upper, and the bones of the face are much smaller in proportionate development than those of the head. Ossification in the lower jaw precedes all of the other bones, except the clavicle, and during the first year will have united it into a single bone. Its wedge-shaped form, almost with the first breath, is forced against the non-resisting tissues, which will ultimately develop into the palate bones and the superior maxillary, these in turn crowding the correlated structures, destined to become with complete ossification the bones of the nose and face. In sucking, mastication, perverted or too constant antagonism, stimulated by nervous habits, a force, powerful from the beginning in comparison with the yielding tissues against which it is directed, is exerted, which continues to increase until in the adult development a strength is acquired that is capable of exerting a crushing force equal to at least two hundred and fifty and in some individuals more than three hundred pounds. It is but natural to conclude, under these conditions, that during the developmental stage the shape of readily-yielding bones in young children must be largely governed by this controlling power.

As an illustration of the effect of unopposed muscles upon the form and structure of the nasal septum, I would refer to Figs. 1 and 2, which show both cast and photograph of a typical case of neglected double hare-lip and cleft palate. Instead of a thin, almost transparent wall, it was found in this case that in order to restore

natural form to the features nearly an inch and a half of solid bone, varying from one-third to one-half inch in thickness, had to be removed. These are typical cases and could be multiplied by way of illustration almost indefinitely, if it were necessary to do so. The principles underlying the reason for these distortions of form in the abnormal character of bony growths are not so well understood as they ought to be, but the influence of the muscles of mastication, exerted upon and through the lower jaw, would seem to leave very little need to seek for another etiologic factor.

Orthopedic and orthodontic appliances calculated to correct deformity in older patients depend upon the well known principle that steadily exerted pressure will bring about absorption at the point of irritation if not so severe as to cause acute inflammation. The osteoclasts employed in this office will, under favorable conditions, become osteoblasts or tissue-builders, to the end that the new and more desirable form will become permanent. Nature's orthopedic appliance works upon exactly the same principle. Therefore compression which will prevent or interfere with the development of the dental arch must compress the bones forming the nares and restrict the normal growth of those which form the nasal septum.

Dr. Black of Milwaukee in a paper before this Association last year summed up the etiology of deviation of the nasal septum so carefully that it is worthy of repetition at this time—"Taking into consideration the development of the several bones involved, we find at birth the ethmoid consists of two lateral masses which are small and ill-developed. The horizontal and perpendicular plates begin to ossify at about the first year after birth, and the lateral masses become joined to the cribriform plates. The formation of the ethmoid cells, which completes the bone, does not commence until about the fourth or fifth year. The vomer, which consists of two laminæ, commences to ossify from a single center, beginning to coalesce at the lower part, but their union is not complete until after puberty. The superior maxillæ commence to ossify at a very early period, but the sutures between the palate processes persist until middle life. Thus the lower arch, with its two arcs, is fairly well formed at birth, with a joint at the junction with the 'keystone,' which is not solid, and which supports the perpendicular plate, which is partly cartilaginous up to puberty, and the triangular cartilage of the septum is firmly held in bony surroundings for fully two-thirds of its circumference. To my mind, if simple pressure is applied in the right direction to the arched supports the natural law of force will produce deflection of the cartilaginous portion of the septum, provided that the perpendicular plate of bone cannot resist the force. This it cannot do if it is in an abnormal condition as the result of injury or disease."

Talbot has shown, after a wonderfully extended and thorough study of crania, that deviated septa, though frequently associated with high, narrow palatal vaults, are not invariably caused by this condition, but that all abnormal developmental processes are directly or indirectly the result of hereditary tendencies expressed in degeneracy or its opposite, atavism. Traumatic injury, a frequent cause, is not yet so common as to entitle it to the importance attributed by some writers, notably Bosworth.

As a matter of fact, prenatal conditions are beyond our corrective possibilities. We must therefore look to such causative factors as may in reason be controlled, and of these the most important is the lower jaw, as will readily be shown by the following examples: Fig. 3 shows the cast of the mouth of an individual in whose case it

was impossible for the lower jaw to touch the upper except at certain points, after three years of age, and it will be noted that the diameter across at points where contact was possible is about normal, but anteriorly there has been almost no growth whatever, since the arrest of development evidently resulted through a want of the chief enlarging factor, contact with the anterior portion of the inferior maxillary.

Granted, then, that asymmetrical development of the nasal bones, the turbinated bones and the nasal septum comes through the action or want of action of the lower jaw, wherein does the pathologic sig-

nificance lie? Enlargement of the turbinated bones upon one or both sides serves to occlude the passages of the nares, breathing through the nose is interfered with, mouth-breathing in greater or less degree results, and want of oxygenation thus brought about causes hypertrophy of the nasal mucous membrane. Then ensue hypertrophic rhinitis, the growth of spurs, and other pathologic changes tending to partial or complete stenosis of the nasal passages, which, even though removed by operative treatment, have a tendency to recur because of the predisposing conditions.

The indirect results of nasal catarrh are frequently severe impairment of general health, anemia, bronchial and lung affections,

disease of the maxillary, frontal or ethmoidal sinuses, in fact, one of the most common causes of empyema of the antrum is mucous engorgment primarily induced by nasal catarrh. Headache, neuralgia, neuritis and catarrhal conditions of the intestinal tract by extension of the disease along the mucous membrane are also associated affections. Arrest of development and general growth of children who suffer from adenoids, mouth-breathing and nasal catarrh is of common occurrence.

Dench says regarding inflammation of the mastoid process, "The most common cause of an acute inflammation in this region is an extension of a similar process from the middle ear." In reference to Eustachian catarrh he says, "This affection of the Eustachian tube usually arises from acute coryza, or an acute naso-pharyngitis."

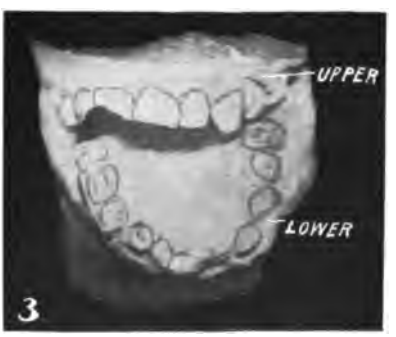
The presence of adenoid vegetations is a particularly potent factor in its causation, since those masses easily become engorged with blood, causing hyperemia of the vaults of the tube, narrowing or completely closing the lumen. At the same time the presence of this soft tissue in the vault of the pharynx affords lodgment to pathogenic bacteria inhaled during inspiration, from which locality they easily find their way into the canal. Under prophylactic measures must be included attention to the mucous membrane lining the nasal passages and the pharyngeal space. Inquiry into the history of these cases shows the patients are subject to frequent "colds in the head or throat."

Removal of enlarged faucial and pharyngeal tonsils, reduction of hypertrophic processes within the nares, and actual removal of any obstructive deformity of the septum or of an extensive hypertrophy of the turbinated bodies are necessary.

Concerning chronic purulent otitis media Dench says—"This disease may follow either acute catarrhal or acute purulent inflammation of the tympanic cavity."

Bosworth says, "By far the most frequent cause of hypertrophic rhinitis, I believe, is deformity of the nasal septum, giving rise to stenosis, and occurring usually in the anterior portion of the passage. In every case the effect is a stenosis of the nasal cavity. The immediate result of stenosis is a gradually developing permanent hyperemia or distension of the blood vessels, which not only causes hypertrophic changes, but is followed by a certain amount of shrinking,

as it were, in the tissues; not the atrophy which we meet with in atrophic rhinitis, but a bloodless condition of the vessels due to abolition of function. * * * The result of hyperemia, of course, is to increase nutrition, and we have as a consequence true hypertrophy taking place, a permanent structural thickening of the membrane. * * * Any deformity which causes a narrowing of the nostrils will cause the same symptoms. * * * Disease of the middle ear, as recognized by notable impairment of hearing, retraction, atrophy, or calcification of the membrane tympani, together with obstruction of the Eustachian tube, as determined by polarization, or the use of the catheter, is by far the most frequent morbid condition of the auditory apparatus met with in connection with intranasal



disease. This affliction is undoubtedly a direct result of hypertrophic process in the nasal chambers."

In a certain proportion of cases of hypertrophic rhinitis tinnitus aurium is met with, usually in connection with middle ear disease, though in a smaller number of cases there is apparently no organic lesion. That this distressing disease may be dependent upon nasal disease is shown by the fact that in a flattering number of cases it disappears under treatment. Hypertrophic rhinitis is also a prominent factor in the causation of attacks of hay fever and asthma. Headaches, eye trouble of various kinds, together with a large number of nervous diseases, such as chorea, epilepsy, etc., occur also in connection with intranasal disease. Diseases of the maxillary, frontal, ethmoidal and sphenoidal sinuses are each or all together a frequent result of hypertrophic rhinitis. The prognosis in these

cases is often grave, necrosis and septic products making the ill effect often quite far-reaching.

"Affection of the sphenoidal sinuses," says Bosworth, "owing to their proximity to the optic foramina, may affect ocular vision or complete blindness may occur. Meningitis and death are always a possible result."

Disease of the larynx, affecting the vocal cords, thus influencing speech, vocal function, etc., and neuroses, such as paralysis, chorea, are by all authorities conceded to be largely influenced by the condition of the upper air passages.

Burrell says, "The arrangement of the nervous supply of the respiratory system in general is favorable to the production of reflex neuroses. The sphenopalatine ganglion supplies branches to the lining membrane of the nose, pharynx and Eustachian tube. It communicates with the facial and pneumogastric nerves, and unites in the closest connection the nose, pharynx, larynx, bronchi and ear."

It can be safely stated, and with due regard for all the existing causes that investigators have assigned for pyorrhea alveolaris, that by far the most common etiologic factor is some variation of occlusion. This statement is warranted by the fact that in every case of chronic disease of the pericementum there must exist one of three conditions—malocclusion, excessive occlusion or want of occlusion. It is obviously true that hyperemia of the pericemental vessels must, on account of the limited space and conical form of roots, cause more or less displacement of the relative positions of root, alveolus and occlusal surface.

If there be a preexisting irregularity or malocclusion the ill result is enhanced and the condition made worse. If the alignment of the tooth crowns be regular, and the occlusal surfaces are perfectly normal when in contact, then even a slight elevation of one or more must at once disarrange the mechanical harmony, with the result that the force of the muscular action of the lower jaw is brought directly upon the individual teeth that are affected. The slight yielding under this stress, a movement of the root in its alveolar socket, whether perpendicularly, or in a lateral direction when long and constantly continued, is favorable to a low grade of inflammation, and to absorption of the bony structures in the direction of applied pressure. The space thus produced, by destruction of sur-

rounding and protecting tissues, allows the entrance of pathogenic bacteria, in the presence of which the tissue cells, having lost or at least suffered a marked reduction in their power of resistance, readily undergo degenerative changes, hence the pus pockets. Continued progress of the disease is marked by a thickening of the apical portion of the pericementum, a still greater elongation of the affected tooth, more extensive liquefaction of tissue and exaggeration of all symptoms.

Talbot in his pathologic researches has shown very conclusively

the inflammatory changes which the pericemental, alveolar and gingival structures undergo in what he terms interstitial gingivitis. He first developed the fact that round cells of inflammation were to be noted far in advance of those grosser changes by which our microscopic observation was prone to place a limit upon the affected area. This must naturally be so, since traumatic irritation affects the deeper portions of the pericemental surface, and through this makes possible more superficial symptoms.

The uric acid diathesis, or a gouty tendency, autointoxication, mineral poison, nervous affections, any interference with metabolic change, disturbance of the function of any organs of the body, and

particularly, such as have the office of eliminating waste products, may each be predisposing, or even existing factors; as indeed, they may and do play such part in relation to any other disease, but in every case it is the mechanical activity of the lower jaw that makes possible the pathologic changes that take place.

It is only reasonable to suppose that, with the force of the jaws pressed tightly and continuously upon certain teeth, the moment such pressure is removed the immediate result would be a hyperemia of the pericemental and other vessels about the roots; frequent repetitions of this would bring about a chronic inflammation, evidenced sometimes by pyorrhea alveolaris, but very frequently this low degree of inflammation, through peripheral excitation, is undoubtedly responsible for many reflex nervous symptoms and often very serious ones.

These manifestations of the "jaw muscle habit" are comparatively easily recognized, but there are others less understood, though having a grave pathologic aspect when fully comprehended. The reason for this habit I have upon other occasions explained as follows: Whether central irritation be excited by some other primary disease, and the peripheral irritation thus be a secondary result, or the local disturbance an exciter of the cortical centers, the effect of the factor in disease is manifested by constant grinding or continued active pressure of the jaws, through unusual activity of the muscles of mastication, generally during moments of self-consciousness or sleep, but almost invariably without knowledge of the patient as to the extent or seriousness of the action. Besides the pericemental results of traumatic irritation, we have a more grave condition resulting where teeth are crowded in the arch. The bell-shaped or contoured natural crowns, when crowded together by pressure exerted in this way, are forced more or less out of line, and a tension of the nerves and vessels at the apical portion of the root in their passage through the alveolar socket results.

Thus we have nerve-stretching, which in my opinion accounts for many nervous manifestations and is a frequent cause of persistent neuralgia, or keeps the individual in a state of tension which is extremely wearing upon the vital forces.

Premature puberty, sexual precocity, epilepsy, gout, insanity, rheumatism, obesity and other nutritive degeneracies, according to

Kiernan, occur during what he terms the period of stress, centering around the conditions attendant upon and connected with the eruption of the first molar.

Brauer emphasizes the fact that convulsions in children require attention, to even the very small sources of irritation. In my own experience, very grave conditions have been relieved by adherence to this simple principle.

Another effect of the habit under consideration is the exhaustion

which is in effect very similar to that of eye strain, an etiologic factor in disease that has received a general consideration not accorded this newer drain upon the vital forces, although its continuance both night and day ought to make it much more effective than where the eye muscles can receive a measure of rest during the hours of darkness. As a matter of fact, neurasthenia is recognized by Weir Mitchell, Moyer, Brauer and many others as having the fatigue symptom for its chief diagnostic symptom. Rest is the recognized cure, and certainly with this unusual activity of the jaw muscles unchecked all methods of treatment must be more or less aborted.

There seems little reason to doubt the fact that correction of these

two last forms of nerve disturbance would relieve many diseased conditions that are, by ordinary methods of treatment, extremely difficult to overcome, and having once developed the fact that there is an association between functional nervous diseases of this character and the jaws and jaw muscles, the whole subject of the etiology and treatment of all of the neuroses and those perversions of nerve action from which neurotics suffer is at once open to us. And it must not be surprising to find that, in addition to chorea, epilepsy, and neuralgia, we may also have neurasthenia, hyperesthesia and anesthesia, as well as paralysis and other diseases, which, though more remote, may nevertheless result from exhaustive factors which impoverish and interfere with normal self-function of any kind.

The following cases are reported to give practical support to the theoretical structure that I have been trying to build for you. Fig. 4 shows the face of a man fifty-five years of age as it was during paroxysms of pain that appeared and disappeared at intervals of about two minutes, sometimes more frequently, though seldom less. There was hyperesthesia of certain areas of the pharynx that made attempts to swallow excruciatingly painful. History of the case showed a gradual increase in severity of symptoms for a period of five years. Only the left central incisor remained in the upper jaw on that side, all the rest having been extracted in the hope of giving relief, but without benefit. This left central was found to be elongated one to two millimeters, much abraded, and pushed forward from the grinding habit. Treatment was to grind down the elongated incisor and extirpate the pulp. An operation was performed upon the main nerve in that region to give immediate relief. Painful symptoms disappeared, and during two years' observation only twice was there a slight recurrence. Upon each occasion it was found that the afflicted incisor had again come into occlusion, and a few turns with a corundum wheel caused a return to normal condition.

Fig. 5 is the same as Fig. 4 after treatment. Exactly a similar experience might also be quoted with a woman about forty, unmarried, who suffered with a burning sensation upon the left side of the tongue, connected with a molar tooth and cured in the same manner.

Fig. 6 is a picture taken at ten years of age. When thirty the

young woman, who had been for some time in a sanitarium, came to me in charge of an attendant on account of her almost irresponsible mental state. Hearing was practically nil in one ear and almost as bad in the other. Contracted upper arch, with extremely high vault and deviated nasal septum, was found to exist in such marked degree that there was almost complete stenosis of the nasal passage and the grinding habit was very marked. The widening of the arch made it possible to operate successfully upon the nasal septum and

to catheterize the Eustachian tubes, which were done by the rhinologists who sent her to me. Correction of occlusion and support of the teeth with appliances gave much needed relief. The result was about fifty per cent improvement in hearing and good health, the latter evidenced by about fifteen to twenty pounds increase in weight. This patient has since married, and it therefore seems unwise to publish her picture as she is at the present time, but a study of her childhood likeness should teach us much, since those defects which were to cause such great trouble afterward are already apparent. All such children should receive care which would anticipate and prevent future disease.

Fig. 7 shows the nose of a young lady, with arrest of development due to traumatism in childhood. Protrusion of superior teeth and saddle-shaped arch were naturally associated with enforced mouth-breathing. Correction of the dental and palatal defects widened the nasal passages and made possible operation by Dr. Wurdemann, which completed the case with result shown in Fig. 8.

In Fig. 9 may be seen arrested nasal development due to mouth-breathing made compulsory by cleft palate and adenoid vegetations. Extreme difficulty was experienced in giving anesthetic. Closure of the palate by operation has not only given this boy of ten ability to acquire nearly or quite perfect speech, but we know also that the next few years will show a marked difference in the appearance and usefulness of his nose.

The results accomplished I refer for your consideration, with a full knowledge upon my part that psychic influences very largely affect all methods of treatment in the care of neurotics, and yet it is no more unreasonable for us as dentists to claim a full measure of importance for that which lies within our own field of action than it is for those who treat other special portions of the human organism.

Discussion. *Dr. R. H. Hofheinz*, Rochester, N. Y.: Dr. Brown stated that in all cases of pyorrhea malarticulation or malocclusion was present to a greater or less degree. I have pyorrhea in my own mouth, existing only upon the mesial root of a lower molar which I believe has perfect articulation. One of my patients, aged fifty-five, with the most perfect articulation that I have ever seen, has pyorrhea only on the left superior first bicuspid. Where malocclusion and pyorrhea are present in the same mouth, the question arises whether the former is the cause of the latter or vice versa. The case which Dr. Brown presented is particularly interesting to me because the patient was under my care for some time. None of those who saw the case diagnosed malocclusion as the cause of the pyorrhea but as the result, and I think that pyorrhea would certainly have existed even if the occlusion had been perfect. A careful examination of the models shows that almost perfect occlusion is present on the right side. Dr. Brown could not treat the pyorrheal condition of the first molar without destroying its pulp, and in that tooth at least he did not change the occlusion. I have seen the patient recently and will gladly acknowledge that the result of the treatment is very

gratifying, but I differ with Dr. Brown as to the method of achieving it. True pyorrhea is invariably accompanied by a pathological peridental membrane, and the very fact that Dr. Brown changed the occlusion shows that he moved the teeth to a considerable extent and altered the condition of the membrane. I think an acute condition was produced which has changed to a cicatricial condition of the peridental membrane, such as we often find in replanted teeth. Four years ago I extracted, because of chronic abscess, a first bicuspid

NO. 7. NO. 8.

from the mouth of a woman fifty years old, and replanted the tooth with complete success up to the present time. At the date of extraction no pyorrhea was present in the mouth, but since that time it has developed on all the teeth with the exception of the replanted one. In this case we have either entirely destroyed the peridental membrane and there is no regrowth, or if there is a regrowth it must be of a cicatricial nature. In many cases pyorrhea has been caused by malocclusion alone, but I cannot believe that the latter must always be present where the former exists.

Dr. M. L. Rhein, New York: The patient from whom this model was taken was sent to me for an opinion about a year ago, and I made a very careful examination at that time, so heartily agree with the view that Dr. Hofheinz takes of the case. The patient presented every evidence of malnutrition, which brought about an increase in the movement of the teeth in their sockets and a constantly greater amount of malocclusion. It is of course agreed that in the treatment of all forms of pyorrhea alveolaris the correction of any malocclusion is an essential feature of success, but I differ absolutely from Dr. Brown's statement that the immediate exciting cause of pyorrhea is invariably some form of malocclusion. The clinical history of many pyorrhea cases in advanced life, where there has been no previous malocclusion, and where the early occlusion was as nearly normal as possible, certainly refutes this assertion. The case under discussion showed a neurasthenic condition, and the general deterioration of the entire nervous system undoubtedly depreciated the nutritional condition of the patient. Both Dr. Hofheinz and I earnestly impressed upon the patient the great assistance to be derived from hygiene, proper nourishment, etc., and the improved nutrition played a very important part in the marked improvement seen in Dr. Brown's case. I appreciate very much what he did, the difference of opinion between us is simply as to which was cause and which effect.

Dr. R. Ottolengui, New York: Under my care at the present time is a woman who had always enjoyed good health and who has brought five healthy children into the world. At the time of the menopause she became mentally deranged and was put in a sanitarium for nearly two years. She gradually recovered her mental health sufficiently to go home, but during the time a deafness which had been gradually coming on became very much aggravated. She has evidences of magnificent dental skill in her mouth, yet she comes to me frequently because her teeth "feel rough," as she describes it. I find every evidence that she grinds her teeth at night. I would ask Dr. Brown if part of her mental derangement and deafness is due to her habit of grinding the teeth, or whether the grinding is simply a concomitant pathological symptom of mental derangement, as the habit is common in insane asylums. Dr. Brown's success in a case of this kind leads me to hope that this patient may be helped in the

same way, and I would ask him what line of treatment might be followed.

Dr. Brown: I will agree that an interference with nutrition will make the pericemental tissues less resistant so far as any pathological condition may be concerned, but when I plainly see some factor that is rapidly aiding in bringing about a diseased condition locally, even though there be more general disease, I know that improving the local condition will help the general condition. In such a case, when

there ceases to be the turgid appearance of the gingival margins, indicative of a poor local circulation, and when infection from pus pockets and absorption of their toxic products are done away with, I know the general condition of the patient is going to be better. It is not my business to undertake the general treatment of the patient, yet my local assistance has made general treatment a practical, beneficial possibility, which would not be the case if the local trouble were unchecked. In the case under discussion I found the condition which I stated, and it was of comparatively little consequence whether it came from some hereditary cause or something else—my first duty was a local duty.

I repeat that it is impossible to have a case of pyorrhea without other malocclusion, excess of occlusion or lack of occlusion. In each of these three conditions we have an unhealthful, unnatural state which disturbs the pericementum and induces pathological change, laying it open to pyorrhea and possibly to other affections. I think a good many of the diseased conditions which we recognize, and many which we do not, are caused by changes, which we do not yet understand, taking place around the apical portion of roots, in the pericementum and in the pulp.

In regard to Dr. Ottolengui's patient, it is impossible to tell just what the result would be. In the treatment of these patients I endeavor to ascertain where the trouble lies, and then associate myself with a man whose specialty is the treatment of that particular disorder. The same is true with these nervous affections. The treatment should remove the strain from the system, and relieve whatever symptom is an aggravating condition. That is what we are trying to

do by correcting these jaws and by using the rubber pad. This is a rubber plate, with hard rubber in the center, that goes over the crowns of the teeth so that the jarring or irritation may be removed. If you grind on one of your teeth, or put something between two or more of them, you will notice an intense desire to continue the pressure, and this is the case with a nervous patient. I am sure that grinding off with a wheel a little of Dr. Hofheinz's tooth will make him feel relieved almost immediately. This has been the result with every one of these patients.

Dr. Grant Molyneaux, Cincinnati: Will you please repeat your remarks about the glenoid fossæ?

Dr. Brown: This patient had such an extreme movement of the jaw that it was possible for her to bite forward as far as those teeth extend, as you see them in the cast, and to bite back again at least one tooth further back than normal articulation should allow. The lateral motion was very great, and it became apparent that the continuation of this habit had brought about absorption in the glenoid cavity under pressure, which is a natural result.

Dr. Molyneaux: Dr. Brown did not dissect the patient to find out whether there was any absorption in the glenoid cavity, and I do not believe that the absorption was produced unless there was some other process going on. I think the condyle was involved. Unless there is a suppurative process going on, no matter what happens to the condyle and below the condyle, in very few instances is the glenoid fossa affected to any extent. All the disturbance will be in the condyle, and the occlusion of the teeth does have an important bearing upon it, but not upon the glenoid fossæ. I have made dissections for twenty years myself and have seen many specimens.

Dr. Brown: To modify my statement, I refer to the temporomaxillary articulation, which is the only essential thing. I have not dissected many people, so do not know whether or not Dr. Molyneaux's statement is correct, but if it is he should go on record to that effect, and I will be glad to accept the facts.

Dr. M. H. Cryer, Philadelphia: Three years ago before this Association I showed two specimens of skulls where the eminentia articularis had been resorbed and had left a perfect groove in the anterior wall of the glenoid fossæ.

SECTION V.—Continued.

Congenital Clefts of the Palate in Infants (Stereopticon Exhibit).

PAPER BY TRUMAN W. BROPHY, OF THE SECTION.

It is not my purpose to review the literature of surgery of the palate, but to point out to you by means of the anatomical pictures which I shall project upon the screen abnormal relations of the superior maxillary bones, with special reference to the nasal passages, which almost invariably are observed in patients having congenital cleft palate.

I was fortunate enough to procure, through the kindness of Dr. J. S. Stone of Boston, some slides which were made from photographs of cut sections of two infantile cadavers in which the deformity of double hare-lip and cleft palate existed. Dr. Stone made use of these pictures in an article published in the *Boston Medical Journal* to show that the method I have devised in transfixing the bones and immediately approximating the cleft is objectionable. They enable me, however, to present in a better, more satisfactory and convincing way than I have ever before been able to do, the efficacy, expediency and the unquestionable merit of the methods I have devised and which I practice.

These pictures are made from sections from an infantile cadaver. The tissues were frozen, then vertical sections were carefully made through all of the facial bones, so that they are anatomically correct. The first one shows the integument and facial expression, in which the deformity is very conspicuous. Section after section has been made from before backward. The picture now upon the screen is from the collection obtained from Dr. Stone. You will observe that it presents a good likeness of a child which has bilateral hare-lip and congenital cleft palate.

The next picture is made from a vertical section of the tissues

immediately back of the preceding picture. You will be impressed with the fact that as here exhibited the upper jaw is very much broader than the lower. You will see that the lower jaw or alveolar border comes in contact with the inclined plane of the hard palate, meeting it inside of the alveolar border, and pressure thus made by the lower jaw against the upper is continually wedging the separated portions of the upper jaw further and further apart. You will also observe that there is an abundance of tissue to form a good hard palate if the bones of the upper jaw are pressed together so that the edges of the cleft will be brought in contact. The upper jaw would then be of the same width as the lower.

It is a rule that in congenital cleft palate there is not a deficiency of tissue in the median line, but that there has been failure of union and the bones have been crowded apart by action of the lower jaw in embryo, and I believe that the widening of the fissure begins at the time when the muscles of mastication first become active. This may be demonstrated to the satisfaction of anyone who will examine a cleft-palate child, and bring the lower jaw in contact with the upper, when it will be seen to immediately force apart the hemispheres of the upper jaw.

There are cases of insufficient palatal tissue to enable the operator to produce a good palate, but they are extremely rare.

The third section which I present is especially impressive by reason of the fact that the nasal opening is shown to be unusually broad, as is always the case in clefts of this character. You will see that the lateral walls of the nares form an inverted V or a triangle, the base of which would be upon the palatal plates of the maxillary bones.

Does it not seem self-evident that when the palatal plates of the bones are brought in contact, the walls of the nares brought more nearly to their normal condition, and firmly held there by properly adjusted silver sutures, the deformity may be thus overcome and the parts restored to a nearly normal condition?

It has been said by some practitioners that the forcing of the jaws together in this manner would cause a deformity by contracting the upper jaw; furthermore, that it would result in nasal stenosis. These statements have been based on theory without a knowledge of the facts, but in the light of a clinical experience and proof thereby established nasal stenosis has never been a sequela of this operation.

In the early history of this operation criticism was offered on a ground of incorrect prognosis, but it is very gratifying to me to find eminent surgeons in the United States as well as in Europe commending and adopting the method here advocated.

Discussion. *Dr. W. J. Roe,* Philadelphia: The point which Dr. Brophy makes, that in cases of congenital cleft of the palate and alveolar process there is not only a cleft but a separation, and consequently an increase in size of the nasal chambers, has been verified in my experience. Since he gave his instructive paper and presented cases before this Association three years ago, I have given the subject careful study and heartily concur in his conclusion, having seen this condition in such cases as he describes. In those cases which I have treated by the Brophy operation I restored practically the normal size of the nasal chambers, and replaced a portion of their lateral walls to what their position should have been.

Dr. B. G. Maercklein, Milwaukee: I wish to protest against the manner in which these cases are usually treated. Any number of physicians and surgeons defer this operation until later childhood or adult life and nothing could be more detrimental to the interests of the patient. In the cases which Dr. Brophy presented three years ago the ability to speak correctly was most striking. I do not understand why it is not possible to produce as perfect speech after the age of sixteen to twenty as we secure after operations upon children. Ten years ago I operated upon a child ten years old, and its speech is now practically perfect. I operated on two cases, sixteen and eighteen years of age respectively, and the speech is defective and probably always will be. The only explanation I can give is, that it is owing to the lack of proper training of the muscles of speech in early childhood. I have likened it to the condition of an adult foreigner who attempts to acquire our language. It is almost impossible to get rid of the peculiar foreign articulation, and his pronunciation of certain vowels is invariably defective. This is attributable only to the lack of cultivation in early childhood, for a child of any nationality, if brought to America early in life and thrown among English-speaking people, will pronounce our language as fluently, as perfectly, as anyone can. When we operate upon these cases of cleft palate in infancy, making a more perfect approximation than we can in adult life, giving the patient the benefit of years of training of

those muscles, we are bound to secure better results than in later operations. I recently saw a case of Dr. Brophy's of a double cleft, a double hare-lip, the intermaxillary bones projecting and being attached to the tip of the nose and the points of the vomer. A more complete case of deformity of this kind could hardly be imagined, yet both jaws were successfully approximated, a bony union took place, the intermaxillary bones were subsequently reduced, and finally operations, first on the soft palate and afterwards on the double hare-lip, were successfully performed. In my opinion that child will acquire perfect speech by practice, and it could not possibly have acquired any speech with such a deformity existing.

Dr. Thos. Fillebrown, Boston: I do not see how any man could use such pictures to prove that the nasal passages would be contracted by the operation performed by Dr. Brophy, for the maxillary bone is separated from the nasal wall and the nasal passage is not narrowed at all. I can produce patients enough to prove that the nasal passage is not contracted in the least. I am sure those pictures were produced by a man who had not done the operation according to Dr. Brophy's method.

It is not correct to state that you cannot produce as satisfactory articulate results in an adult as in a child. My children have not reached adult life, so I cannot tell what the final result will be, but I have a phonographic record that was taken of a patient sixteen years old within three weeks after an operation for cleft palate. Before the operation he could scarcely make himself understood, but I will leave it to any man who listens to this record to say if the speech is not as good as in the majority of people. A month after the operation his teacher stated that it would be impossible to pick him out of a crowd by his voice, and I can produce several patients who will show equally good results.

Dr. Maercklein: I accept Dr. Fillebrown's statements as to these particular cases. He may produce individuals operated upon in adult life who have become as proficient in speech as those operated upon in infancy, but as a general proposition my statement is correct, that this seldom happens.

Dr. R. Ottolengui, New York: I agree entirely with Dr. Maercklein's proposition—that the only hope of correcting a cleft palate, by which I mean the restoration of the organs so that perfect speech

may be attained, lies in early operation. The evidence advanced by Dr. Fillebrown is entirely negative, for the fact that certain operations in individual cases have resulted in perfection of speech does not in any sense inveigh against the principle that the earlier the operation the better. I have seen persons with large clefts in their mouths who might mingle freely with this audience and not be detected by their speech. The few successes which Dr. Fillebrown has had—that is, few in proportion to the many thousands of operations that have been performed upon adults—do not weigh at all in the balance of the argument that surgical operations performed upon adults prior to those of Dr. Brophy have been a failure and a blot upon surgery. What success Dr. Brophy has had with his operations on adults, or on children old enough to have acquired bad habits of speech, seems to me very largely dependent upon his technique and upon a point which in the past has been overlooked by surgeons, and which at present, with the exception of one or two men, has been ignored by dentists when attempting to restore speech by artificial means. Surgeons and dentists have taken the cases as they have found them, and have attempted to simply occlude the sides of the cleft—in the case of surgery by plastic operation, and to plug them up in the case of dentistry. Sometimes the result was a high vault which the tongue never reached in articulating those sounds where it was essential that it should touch the roof of the mouth. Dr. Brophy's operation peels the soft parts away from the palate bone and brings them down so that an entirely different vault, less in height, is produced, thus enabling the tongue to reach those parts, and thus producing satisfactory speech. The same is true of the Kingsley obturator. This is not simply a plug in the back of the throat, but in all cases the mouth is studied and the plate is made not to form too high a vault, but to bridge it and produce a lowering of the dome, thus allowing the tongue to reach the roof of the mouth in the formation of those sounds. It would surprise me very much to find that the phonographic records of Dr. Fillebrown are of any value. While the articulation may be very often obtained by surgical or mechanical means, one of the most difficult things to overcome is the nasal resonance, and I have never heard a phonographic record, even from a normal voice, that did not conspicuously show what seemed like nasal sounds. Conse-

quently those records would not indicate at all whether or not the patient had overcome his nasal resonance, and would give an entirely inadequate report of what he could do. It seems to me that some of the plastic operations might be much improved, and especially that if the nares could be properly occluded anteriorly and posteriorly the nasal resonance would be overcome. In making an obturator it would be of advantage, before making the final instrument, to test it in the mouth for days at a time, building up or cutting down as needed, to see whether the nasal resonance could be overcome.

Dr. Brophy, closing discussion: I brought out these pictures to show beyond the question of doubt that the operation which I have devised cannot close the nasal passages. I have never referred directly to the utterances against this operation, based on the supposition that it would cause nasal stenosis and produce greater deformity than that which previously existed. This statement was also made in a textbook written by Dr. Marshall, and it was not based upon any positive information but upon a theory. I recently made sections of an infantile cadaver to show the normal relation of the walls of the nares, the relation of the upper to the lower jaw, the expansion of the nasal passage in deformed patients, and to establish the fact that the upper jaw is widely spread. As Dr. Roe has stated, we have not only a cleft throughout the length of the palate, but having that cleft the separated maxillary bones grow wider apart by reason of the force exerted upon those inclined planes within the alveolar borders by the pressure of the lower jaw, and I contend that this occurs in embryo. I am entirely satisfied that this spreading occurs before the child is born and continues up to the time when the process of ossification is extended so that the bone will no longer readily yield to the pressure of the lower jaw upon the inclined planes formed by the arch of the upper jaw.

I have long been on record as urging early operations, though I recognize the value of later operations, because we sometimes restore perfect articulation in them, but in other cases this is impossible.

Dr. Kingsley reports the case of a man for whom he adjusted with the greatest of care an obturator, and who in the hands of an elocutionist learned to use the instrument so that he could speak very well. Later he developed a nasal tone and lost to a considerable ex-

tent the results of the training, simply because he grew careless. No matter what sort of a palate is made for a patient, no matter how perfect it may be, and no matter how successful technically the operation may be performed, he will continue to speak badly unless he is carefully trained. Dr. Kingsley has clearly and beautifully outlined the behavior of the tongue in the enunciation of sounds, and has shown its position in pronouncing certain ones. Take for example the consonants, t, k and s. To pronounce the letter t the tongue must be placed against the upper incisors or back of them, and then quickly retracted as the expulsion is made to produce the sound. These consonants always bother a cleft-palate patient, and in trying to pronounce the letter t the tongue will lie flat on the floor of the mouth, and he will make a terrific expulsion of air, but to no purpose. All of the technique and mechanical manipulation of the tongue must be taught a cleft-palate patient who speaks badly.

SECTION I.

Prosthetic Dentistry, Crown and Bridgework, Metallurgy, Chemistry and Orthodontia.

Premature Extraction of Deciduous Teeth.

PAPER BY H. A. PULLEN, OF THE SECTION.

One of the chief causes of complication in the diagnosis and treatment of malocclusion of the teeth, coupled with injudicious extraction of permanent teeth, is the premature loss of deciduous teeth by extraction or decay. The deciduous teeth are often wantonly sacrificed by the dentist, who, although he may be relieving suffering, seldom stops to consider the effect upon the harmonious development of the permanent teeth, trusting to Nature to bring about normal arches, no matter how badly she is abused. Again, caries is responsible for the premature loss of the deciduous teeth several years before the time for their successors to appear. Also, these teeth are extracted by parents for their children without advice from the dentist.

The exact time for the natural loss of such teeth cannot be stated definitely, but varies with the individual, the tooth in question, and the prompt or retarded development of the succeeding permanent tooth. The ideal time is, of course, just when the permanent successor has reached the level of the alveolus, preparatory to eruption through the gum tissue, the roots of the corresponding deciduous tooth having been absorbed, permitting its easy removal.

Now, as to the effect of such loss upon the development of the permanent teeth in their correct position in the arches. If the deciduous tooth is extracted eighteen months or more before the time for the natural eruption of the successor, partial or complete closure

of the space almost inevitably takes place, thus shortening the arch by the width of that tooth, and producing a lack of harmony in the relation of both jaws that is very apt to cause a serious irregularity unless operated upon in time. Interstitial growth of the jaw is interfered with at the same time, accounting for the lack of development in the region of the lost deciduous tooth.

Common observation reveals the fact that the deciduous teeth are very seldom irregular. We usually find harmony in size and shape of arches, jaws and teeth during the period of retention of the deciduous set as a whole. It is only when one or more of the deciduous teeth has been prematurely extracted that irregularities begin to

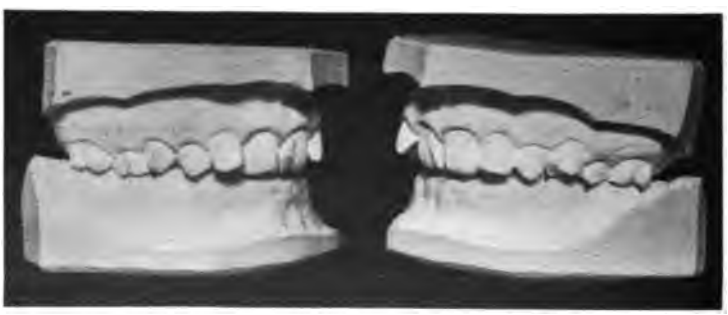


FIG. 1.

manifest themselves, and these usually appear as shortened lateral halves, undeveloped arches, and consequent lack of room for the erupting permanent teeth. The photographs of models illustrate cases in which deciduous teeth have been extracted, causing either primarily or secondarily some irregularity of the teeth.

On the first model, illustrated buccally and occlusally in Figs. 1 and 2, the cause of the irregularity is primarily from the loss of the inferior second deciduous molar on the left side. It will be noticed in Fig. 1 that the case belongs to Class I (Angle), the jaws being in normal relation from the first molars distally, the irregularity being confined to the teeth anterior to the first molars, and consisting in a contracted lower arch, principally on the left side where the space of the lost deciduous molar has been closed up. (See Fig. 2.) The lower incisors are considerably distal to their normal positions. As

the upper centrals depend on the lower centrals for their support, the conforming of the upper arch to the lower anteriorly has produced a lingual inclination and position of the upper centrals, and an apparent labial position of the upper laterals.

That this serious irregularity should be caused by the premature extraction of a single deciduous tooth ought to be sufficient proof of their unit value, and a warning to the careless operator of the possible results of such extraction.

In the case illustrated in Figs. 3 and 4 the loss of the deciduous tooth is a secondary cause, the primary one being a general lack of development of the arches. The right and left buccal views of the

FIG. 2.

case in Fig. 3 prove that it also belongs to Class I, the molars being in their normal relation and the irregularity confined to the anterior teeth.

Figs. 5 and 6 illustrate the undeveloped arches due to premature extraction of all the deciduous teeth before the age of nine years. The resultant effect upon the facial profile is very marked, both lips falling in, giving a senile expression to the features.

In the process of development of the jaw by the interstitial growth the wedge-like influence of each deciduous tooth plays a prominent part, hastening and stimulating the enlargement of the arches by the lateral pressure of the teeth in the arches. The permanent teeth require more space for their eruption than the preceding deciduous ones, on account of their larger size. One exception to this rule is

the second bicuspid, which is considerably smaller than the second deciduous molar, which it succeeds. This increase of space is obtained by the lengthening of the lateral halves of the arches. When the first permanent molar begins to erupt it has to make space for itself between the second deciduous molar and the maxillary tuberosity and the ramus, above and below respectively. This pressure is felt by all the other teeth in each arch, and they are carried forward, coincidently with the natural development of the jaw.

If the second deciduous molar be extracted at this time, preceding the eruption of the first permanent molar, the wedging influence of the latter will be expended in moving itself forward into the space

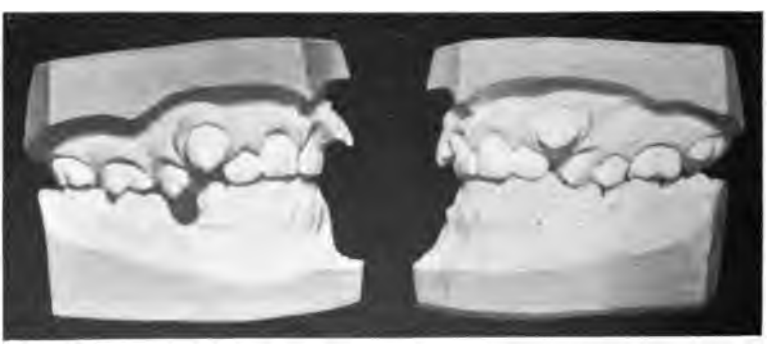


FIG. 3.

of the lost molar, and development on that side will be arrested, and inharmony in the size of the arches will be thus established. Also, the second bicuspid has no space in which to erupt, and consequently will be forced into buccal or lingual occlusion on eruption.

Another tooth which is often prematurely extracted with the idea of making more room for the incoming permanent lateral is the deciduous cuspid. No greater mistake can be made than that of extracting deciduous teeth to make room for the permanent. While the premature loss of the deciduous molar and cuspid in either arch produces the most harmful results, the principle applies to the premature loss of any of the deciduous teeth, the difference being only in degree.

Drs. Angle, Goddard and Guilford in their writings most emphatically protest against the premature extraction of these teeth. The former has suggested to us the mechanical retention of the space of a lost deciduous tooth until such time as its successor shall appear. This is easily done by banding teeth contiguous to the space, these bands being connected by a wire soldered to each band, or the same result may be obtained by a wire alone, fastened in pits in contiguous teeth and elongated by pinching. It is possible also to regain lost space by proper use of regulating appliances.

With regard to the premature loss of the deciduous teeth by caries, we have in the explanation to the parents of the harmful re-

FIG. 4.

sults of irregularities our most weighty argument in favor of filling the deciduous teeth. So important is it that the full space of each deciduous tooth be maintained until the eruption of its successor, that if its mesio-distal diameter become shortened by caries it should be restored by separation and filling.

Though not properly included in this paper, we might mention the fact that prolonged retention of the deciduous teeth is also a common cause of irregularities.

In either case the X-ray is most valuable in discovering the positions of the erupting permanent teeth, so as to aid materially in the treatment. Many times the permanent successor is missing, and the X-ray revealing its absence prevents us from making the mistake of extracting the deciduous tooth which would appear as retained too long.

One positive indication of the normal development of the anterior part of the arch is the separation of the deciduous incisors at about the fifth year of age. This would tend to prove that at this age contact of the deciduous incisors is not needed to sustain the wedging influence of the other teeth in assisting the development of the arches. Previous to this time, however, there is no doubt but that each incisor, above and below, aids in the process of development by its mechanical influence alone. It is also true of all the other deciduous teeth, that when the succeeding permanent tooth has come up

FIG. 5.

near enough to the alveolar border to sustain its proper space, the mechanical wedging influence of the deciduous predecessor is no longer needed for the proper eruption into normal position of the permanent tooth.

I do not wish to be understood as saying that premature extraction of deciduous teeth is the cause of every non-developed arch, but it is often the cause primarily. Many other conditions may be primary causes, and again, premature extraction of deciduous teeth may be a secondary cause of the undeveloped arches associated with the other conditions manifested primarily.

Deciduous teeth, on devitalization or ensuing abscess, should be treated and retained if possible. If incurable alveolar abscess super-

venes and it becomes necessary to extract, the space should be retained in the manner before mentioned.

It would be wrong to advise non-extraction of an aching or abscessed deciduous tooth, unless the pain could be controlled, as the effect upon the little patient of prolonged suffering is very marked. Also, pus from a sinus may by absorption into the system cause some form of septicemia, as noted in many cases, or result in harm to the alveolar border and developing permanent tooth beneath.

FIG. 6.

Dr. Goddard gives the following general and special rules for extraction of deciduous teeth: *General Rule*—Extract a deciduous tooth only when it deflects its successor. *Special Rules*—1. Do not extract a deciduous lateral to make room for a permanent central incisor. 2. Do not extract a deciduous cuspid to make room for a permanent lateral incisor. 3. Do not extract a deciduous second molar till the first permanent molar is firmly fixed in place, and not then unless the second bicuspid has erupted or is about to erupt out of position.

The only exception to these rules is that of incurable alveolar abscess, as before mentioned.

SECTION I.—Continued.

New Artificial Palate.

PAPER BY C. S. CASE, OF THE SECTION.

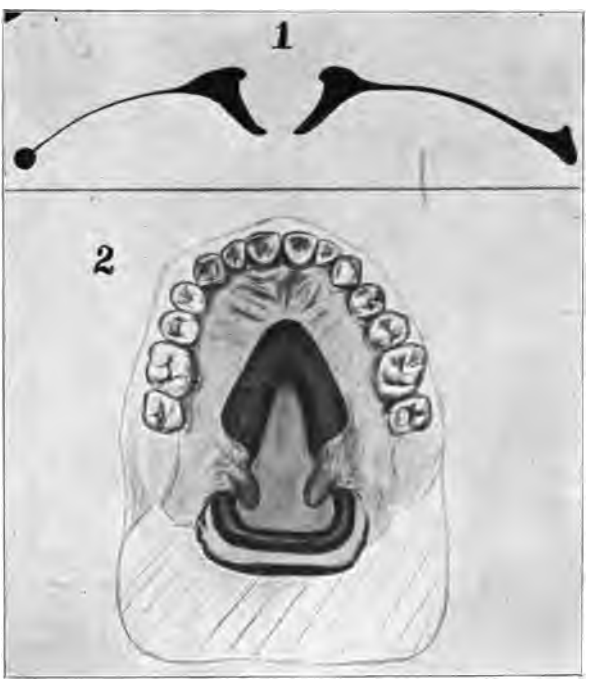
The object of this paper is to present a new form of artificial vela for congenital cleft palate. It follows in principle the Kingsley flexible rubber vela, but differs from them in certain important particulars, both in form and construction. Those who are familiar with Dr. Kingsley's palates, which I am pleased to say I have successfully used in my practice for twenty years, will remember that the veil or posterior portion of the palate is sustained by extending the central thickened portion of the body into the veil, where it is gradually flattened to a comparatively thin edge, that is intended to fit along its border the contracted pharyngeal walls.

In this particular it differs almost diametrically from the palate I am about to describe, in that with the latter all the central portion of the veil and body between the borders of the cleft is thin like rubber dam, while the edge of the veil is thick, in the form of a solid roll of rubber, about one-fourth of an inch in diameter, or three-cornered, flaring from the central thin portion, and so placed that its outer flat surface conforms to the plane of the pharyngeal walls. Figure 1 represents transverse sections through the mesial plane; Figs. 2 and 3 show palate in position.

As the roll or border of the veil extends forward on each side along the lateral walls of the pharynx, it should gradually merge into the body of the palate to form the borders of the artificial floor of the nares.

There are a number of advantages in this form of artificial palate: *First.* The early deterioration and curling up of the edge of the veil is prevented. When this occurs, as it frequently does in a few months with vela having thin flexible rubber edges, unless the

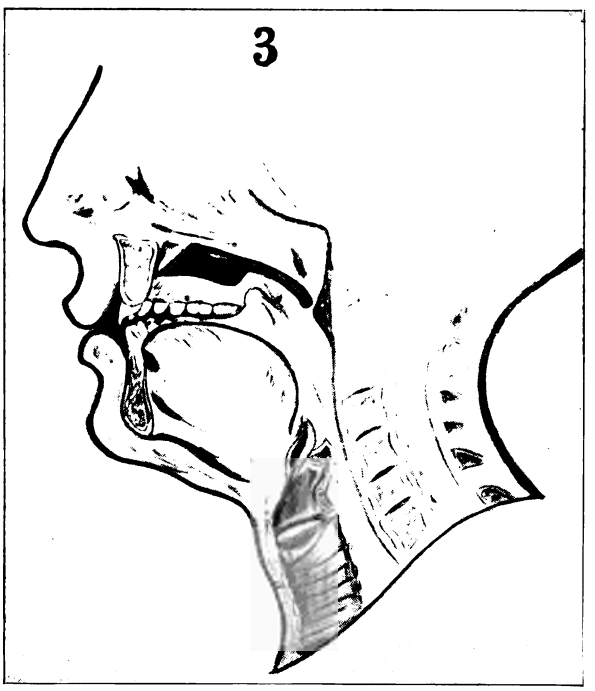
borders are greatly thickened, which adds materially to the weight, the vocal usefulness of the palate is impaired, if not destroyed, in proportion as it permits the escape of air at the curled-up portion of the border. *Second.* The roll forming the border of the veil is sufficiently yielding and flexible when properly fitted to be worn with comfort, and it also presents a stability of movement that permits firm contact of the pharyngeal muscles in their efforts to close



the naso-pharyngeal opening. *Third.* In more or less extensive clefts the thin central portion extending forward into the body of the palate permits a resilient yielding of the lateral portion of the body to the contractions of the bifurcated velum palati. This possibility in the movement of the palate often permits springing it into place with sufficient grasp of the nasal borders to sustain it in position without other aid. *Fourth.* The method of fitting and con-

structing the model of this new palate, as will be described, is one of the principal advantages of its form.

In taking an impression for the construction of this palate it is my object to obtain a perfect model of that portion of the roof of the mouth over which I wish the palatal portion of the palate to extend, and along the borders of the cleft forward of the pendant portions of

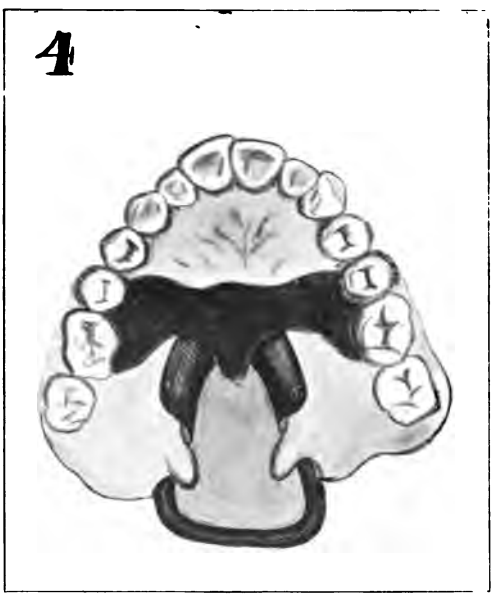


the velum palati, extending somewhat upon the floor of the nares and representing as perfectly as possible the lateral surfaces at the posterior nares.

These surfaces, a part of which lies above the pendant and unstable tissues of the bifurcated velum palati, are frequently susceptible of being perfectly reproduced in the model of a plaster impression. It will usually be found in a typical case that the posterior nasal openings are laterally constricted, from which point the nasal

fossæ widen to form the floor of the nares. By obtaining a perfect impression of these somewhat unyielding surfaces, which otherwise, on account of their position, would be very difficult to reproduce, the thick border of the artificial veil can be perfectly fitted to them, as it merges into the body of the palate to form the border of the artificial floor of the nares.

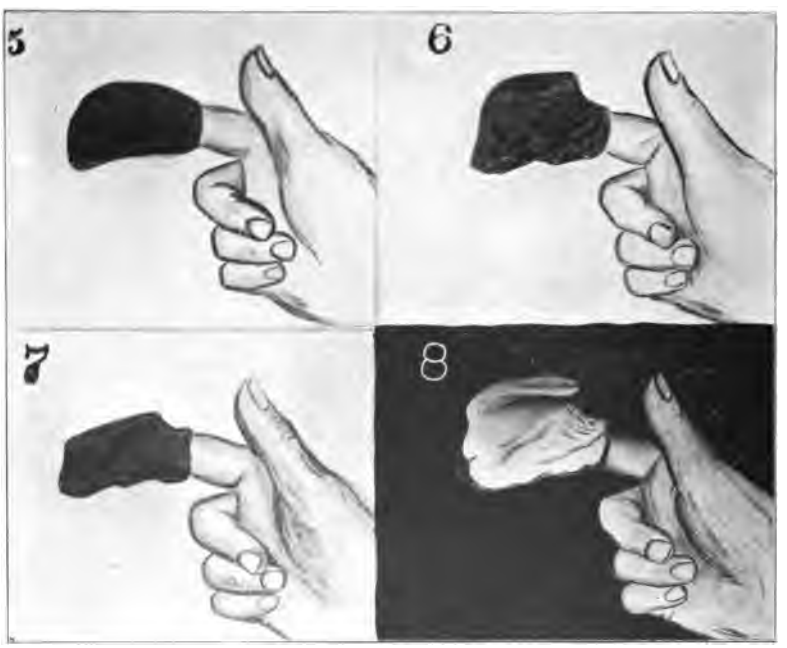
I lay great stress upon this portion of the work, because I have found that this particular form of palate is not only a great aid to



the proper action of the pharyngeal muscles, but that in clefts where the thin central portion can be carried well forward between the lateral wings of the body—as in the two cases the complete models of which I present for your inspection—overhanging nasal borders of considerable extent can be easily sprung into place, and when fitted perfectly patients soon learn to place and sustain the palate without the aid of a supporting plate. I would advise, however, that the supporting plate be made, to enable the patients to more readily adjust and sustain the palate, until they have learned to do without it.

In one of the above cases the palate was made without a supporting plate, and the patient, having worn a palate of a different form, was able to handle and sustain it in position from the start. The four incisors which had been attached to the plate in the first operation were changed to a bridge.

When no artificial teeth are required the supporting plate should



be made to cover as small an area of the roof of the mouth as is consistent with the demands for strength. I rarely extend it forward of the second bicuspids, leaving as much of the natural anterior palatal surface exposed as possible, which I believe materially aids in acquiring perfect enunciation.

Fig. 4, which is made from a model of a mouth with the apparatus in place, shows the form of the supporting plate which I usually make.

Preparatory to taking the impression for an artificial palate, I

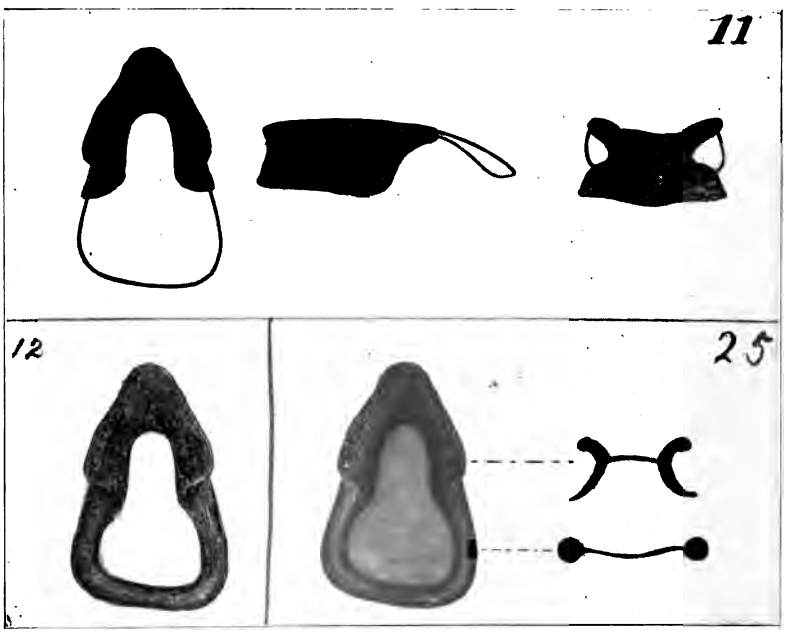
study well the cleft and surrounding surfaces, and then with a piece of modeling compound wrapped around the forefinger (see Fig. 5) I press it gently to place. Removing, softening and slightly reshaping it, I repeat this operation several times, with the view of obtaining a modeling-compound impression that will not displace the soft parts, and that will perfectly support the plaster of the final impression (see Fig. 6). The palatal surface is then roughened, so that the plaster will cling to it, and all that portion of the compound which extends above the borders of the cleft is cut away and the cut surface smoothed and oiled (see Fig. 7).

This, when finally carried to place with the plaster in position, need cause no fear of difficulty in its removal, as all that portion of the plaster which extends above the border of the cleft, forming the impression of the nasal fossæ, will readily break from the smoothed and oiled surface of the compound, and can be rescued by tearing it from its lodgment and allowing it to fall whole or in sections upon a mouth mirror, and is then replaced on the impression (see Fig. 8).

With the plaster model made from this impression, nearly all that portion back of the attachments of the velum palati is cut away, and the nasal borders and lateral surfaces are open and freely exposed (see Fig. 9). This is done to facilitate shaping and ready removal and replacing of the modeling-compound model of the palate during

its repeated adjustments to the mouth, in obtaining the desired form of the model of the veil.

The model of the body of the palate, as shown in Fig. 10, is formed first, and then inserted in the mouth for trial. This can usually be accomplished with the hand alone, by passing it back of its proper position and then bringing it forward. It should be done quickly and easily, or contraction of the muscles will prevent its accomplish-



ment. At this time the lateral nasal extensions of the model should be abridged to facilitate introduction. They can be added at the time of investment and still further extended, as can other parts, by scraping the metal casts.

The surface of the pharyngeal wall in the contracted position of its muscles, which represents the surface that is ultimately to close around and press against the peripheral border of the artificial veil, is obtained with a loop of No. 22 soft copper wire, the free ends of which pass into tubes imbedded in the upper surface of the model, as shown in Fig. 11.

The loop is drawn out and bent to about the proper size and shape, and the model then inserted in the mouth for correction. This is repeated, bending, enlarging or contracting, etc., until the wire is seen to rest along surfaces that are best adapted to unite in their action with the artificial veil for the ultimate closure of the naso-pharyngeal opening.

The posterior line of wire should rest just in front of or slightly above the greatest contracted extension of the superior pharyngeal muscle. (Figs. 2 and 3 show relations of pharyngeal walls to border of veil.) The surrounding muscles can be made to contract by a slight tittillation of the surface, and what is of the greatest advantage—the pharyngeal walls above and below the wire can be readily seen and studied in their action through the open loop.

The action of the muscles alone, springing forward against the pliable wire loop, pressing it back into its sockets, or bending it to fit their surfaces, will frequently cause it to mark the desired peripheral outline of the artificial velum.

As the loop turns forward to pass beneath the openings of the Eustachian tubes, the pharyngeal surfaces will often be found corrugated and thrown into irregular folds, so that in finding the smoother path across these ridges to prevent the escape of air at the border of the veil through the sulci it may be found desirable to raise or lower the wire upon one side more than the other. Forward of this it soon comes in contact with the upper surfaces of the palatal muscles as it enters the posterior nares.

After fitting the wire, to mark the desired outlines of the veil, the roll of compound which is to form the model of the border of the veil may now be attached to the loop, following the outline of its peripheral surface, and finally adjusted to the mouth to correct imperfections.

Fig. 12 shows different views of a model and completed palate.

Discussion. *Dr. R. Ottolengui,* New York: I had always thought until to-night that it would be necessary for those who treat these cases mechanically to decide between a hard rubber obturator and a soft rubber velum, but Dr. Case has brought us a new appliance. He states that it differs essentially from the Kingsley velum, and it certainly does, not only in form but in action and in every feature.

Of course it is not a hard rubber obturator, but I consider it an obturator rather than a velum.

The first feature to which I would call attention brings me back to the very point to which I alluded this afternoon in the discussion of Dr. Brophy's operation, namely, that it is essential—perhaps not in every case, but important as a theory if you are to take up the treatment of this class of cases—in addition to simply supplying an appliance which will make up for the defect in the posterior portion of the palate, to also construct a dome against which the tongue may occlude in making palatal sounds. It seems to me that in this particular respect the anterior part of Dr. Case's apparatus will be found less effectual than the same surface of the Kingsley velum, which is made continuous with the carrying plate and the new curve of the arch which is created. This is not an essential defect, because Dr. Case could undoubtedly readily mold a similar apparatus in which the concavity would be absent.

In the Kingsley upper flap this flap comes down and crosses just at the junction of the split velum. Between the central portion, which connects the upper flap and what we may call the nasal flap with the palatal flap, there is just sufficient rubber to hold the two parts firmly together. They do not come in contact at all with the borders of the cleft, because during speech and deglutition the divided natural soft palate comes together and also droops, and it is the intent of the Kingsley palate to provide a space in which this divided palate shall move. Dr. Case's instrument fits accurately against the border, but in Kingsley's there is a space between that portion which connects it and the border, so that in speech, which brings the two parts together, there is room for the necessary movement. The delicate accuracy which Dr. Case has given to his impression, and his ingenious method of getting it, enables him to fit this portion of his palate very accurately against the borders of the cleft, but he has recognized the necessity of not carrying this down against the soft parts, because he knows they must be allowed to close together. They are commonly so closed that it is practically impossible to take an accurate initial impression of a cleft with any material whatever, because the foreign body immediately causes a contraction of the cleft parts, and however accurate and beautiful the impression and model may appear, the reproduction of the palate

is less in width than it naturally is. In other words, if an obturator were made to accurately fit such a model, and were placed in the mouth, the parts at rest would not touch it at all. In a case of the kind for which Dr. Case's instruments have been made it is evident that the cleft has passed into the hard tissues, and the part holding it is also there. This enables him to get this portion of the artificial palate rigid as he has it and leave some play for the soft parts. I would ask him what will happen when he applies an apparatus of this kind to a case where the division is posterior to the hard palate and entirely in the soft tissues.

As regards my statement that this is an obturator and not a soft palate, the Kingsley soft palate enables the tissues to move, and its back end, which is against the pharyngeal wall, is brought to a feather edge, and can often be made long enough to touch. It is usual to leave it short until the patient becomes able to tolerate it and then lengthen it, so that most of the time it comes in contact with it, but being a feather edge, as the palate rises in its attempt to close the upper nares, it is turned up and offers a broad surface. In the Case appliance we have a thickened border at the back and it must consequently be so set that the rising palate will simply come in contact with it. It may be entirely efficient in the cases where the Doctor is at present using it, but there are other cases where he will find it necessary, to completely occlude the nares, in using an instrument of that kind to have the border much wider, as we make it in the hard obturator.

If it is to be an obturator, why should it be made of soft rubber? The soft rubber would not be so durable as the hard, and hard rubber obturators can be made to serve every purpose. The only advantage of a soft velum over an obturator seems to be that it enables a more rapid progress in the acquirement of speech, but later in life, perhaps at the time when the patient needs a new instrument in any event, speech having been perfected, it is usually preferable to make a hard rubber appliance, which will be permanent and more cleanly than one of soft rubber. Thus the obturator apparently comes with use after the patient has been educated to speak by means of the soft rubber appliance, which should in every sense of the word be a velum. However, in many instances an obturator can be inserted at the outset with very beneficial results.

A cursory examination does not warrant me in condemning Dr. Case's appliance, but I think he has brought something, which, however ingenious, will not be useful as an obturator, being soft instead of hard, and perishable and uncleanly instead of durable and cleanly, nor turn out to be an improvement over the Kingsley velum. Although made of soft rubber I do not think the Case instrument will be at all movable in the mouth, for it is sufficiently rigid to resist the effort of the soft parts to move. I saw this beautifully illustrated in an attempt to make an instrument which should act as a velum though constructed of hard rubber. The movements were to be facilitated by hinges and delicate springs, which should bring the instrument back into place when moved by the soft parts. When held in the hand these appliances would move up and down almost at a breath, but when placed in the mouth in contact with the soft parts they were just as immovable as though there were no springs and hinges at all.

Dr. Thos. Fillebrown, Boston: I understand the matter as Dr. Ottolengui has explained it, namely, that this is an obturator, and that it is in such form as to entirely and at all times shut off the mouth from the nares. The appliance is remarkably ingenious and well done, but if I understand its action right, it is unphysiological, unscientific and unphilosophical. I am aware that Dr. Kingsley said years ago that if the slightest amount of air passed from the mouth behind the velum into the nares you got a nasal twang, and I understand Dr. Case and Dr. Ottolengui to follow in the same line. I think Dr. Kingsley and his followers are mistaken. The fact is, there are only comparatively few cases in speaking or singing when the soft palate is back against the pharyngeal wall. Twenty years ago I commenced to study it in connection with the use of obturators. I soon became convinced that Hemholtz, Seiler, Kingsley and others were in error. I soon found that what was said in regard to Edward Everett was absolutely true—that the far-reaching quality of his voice was due to the proper proportion of nasal resonance which gave the vocal sounding board its normal value in tone production. The nasal twang is not caused by the passage of the sound through the nose but because the nasal passage is contracted. As I am speaking now I know the sound is going through the nose and the sound of the voice is natural, but if I pinch my nose a little I

know it is not going through the nose and it gives the nasal sound so objectionable. If the passage to the nares is closed we lose the resonant power of the ethmoid cells, the sphenoid cells, the frontal sinuses, and the whole upper parts of the head, and any apparatus that is based upon the doctrine that you are to shut off the mouth from the nasal cavities is unscientific because it is unphysiological. There are a few consonants for which you must close the palate, where you must get the force of the air against the teeth, but otherwise not.

Just a word as to articulation. It should not be done in the mouth or in the throat, but with the upper lip. If the velum is held well forward and the words spoken from the lips they will seem to drop off without effort and with great distinctness. The voice will be aided by the articulation and will be full, free and penetrating.

Dr. G. V. I. Brown, Milwaukee: Dr. Case's device was constructed with remarkable ingenuity. Anyone who understands the obstacles to be overcome in dealing with these tissues must realize the great difficulty of making anything like an accurately fitting apparatus such as we have seen tonight. I believe these cases should be operated upon, as there is no doubt that the opening can be closed by operation. I have no use for an obturator. I think the chief difficulty about this will be found to lie in the unusual effort necessary for speech in cleft palate patients who have reached the age of this patient, making these muscles a very uncertain factor. I am sure the power of these muscles and their ability to close such openings is very much greater than people who are not familiar with them realize.

Dr. Grant Molyneaux, Cincinnati: It seems to me that the remarks of Dr. Ottolengui are somewhat contradictory. I should like to know how the Kingsley velum, as he calls it, is more of a velum than the Case velum, which Dr. Ottolengui calls an obturator.

Dr. Ottolengui: I would ask Dr. Molyneaux if he knows what either one is.

Dr. Molyneaux: I know that neither has any physiological action, any more than forming a joint with the living tissue and stopping up the hole. As I understand it, the object in the treatment of cleft palate is to maintain as nearly as possible hearing, vocalization and deglutition, and whether they call the appliance a velum or

an obturator, and whether it is composed of soft or hard rubber, that is its purpose. I do not understand the reason for calling Dr. Case's flexible appliance an obturator and Dr. Kingsley's a velum. Neither of them has any anatomical value. They are both inert material, and simply fill in a gap and take the place of something that has been wanting from birth. The misuse of terms is confusing to those who know nothing about the subject and adds difficulty to it. The appliance which has been presented tonight is a beautiful one in many ways. Interesting problems in mechanics have been surmounted, but the problems of physiology and hygiene have been ignored. As to the wire for measuring the pharyngeal cavity, I think Dr. Case will find practically the same thing described in one issue of the Dental Review. In the models shown one part which aids speech has been observed, but other important problems have been entirely ignored. As Dr. Suersen has said, and he is the only man who has contributed anything scientific on this point, the superior constrictor muscle forms a joint with the obturator or velum, whatever the rubber appliance is, and that is the only way it acts. These flexible rubber vela clog up with mucus on the surface and there is no opportunity left for the action of the muscles, the connection of which has been destroyed by this fissure, to remove this mucous accumulation. I deny that the patient is better off by first wearing a velum or soft rubber appliance, and assert that the obturator in the majority of cases is best in the beginning. It presents a hygienic surface against the muscles, and better results are obtained in speaking and swallowing. In every case where the muscles are divided by operation we have progressive deafness, and by the use of a flexible rubber veil you have not deafness but a lack of sensitiveness in hearing.

Dr. Ottolengui: The difference between an obturator and a velum is this—the first recognizes the abnormal condition of the parts, and is so shaped that, with these abnormal parts working against its sides and end, it makes possible the proper occlusion of the nares in all movements of the palate, so as to produce perfect speech, the obturator itself remaining rigid, and the cleft parts sliding against the lateral sides, these being so shaped that they occlude the cavity when the parts are at rest, and therefore when the cavity is at its widest opening, and they are so slanted that as the parts are drawn

together and brought down they slide along the oblique sides of the obturator, continuing the occlusion. The velum is a mechanical effort to reproduce artificially the original soft palate which is missing. It is a flexible bridge across the chasm, and should as nearly as possible act as the original tissue did. Therefore Kingsley arranged his velum so that when it rested the chasm was bridged. The split parts of the artificial velum allowed a resting place for the borders of the cleft soft parts, and the artificial velum was made sufficiently flexible that in any position they might assume in the closing of the aperture they would carry along the velum. The obturator is rigid and immovable and the soft parts move against it, while the velum is flexible and movable, and is carried with every movement of the soft parts. There is just as much difference between them as there is between the fixed bridge and removable plate.

Dr. Molyneaux: I do not think Dr. Ottolengui has explained the point. He says the obturator recognizes abnormal conditions, but it is an inert substance and can only stop the opening. We cannot endow flexible rubber with blood vessels, flesh and nerves.

Dr. Case, closing discussion: I should like to correct an impression that Dr. Fillebrown seems to have in regard to the action of the artificial palate, whether it be an obturator or a velum. He remarks that Dr. Kingsley says—and he seems to think I claim the same thing—that it is made to shut off at all times the naso-pharyngeal opening. That is just what it was never made for by Kingsley or any other man.

Dr. Fillebrown: I did not so state.

Dr. Case: I understood Dr. Fillebrown to say that it was to close the opening, and in closing the opening at all times it produced a nasal twang, and he represented it by closing the nares to show that such was the fact. If the naso-pharyngeal opening were closed at all times or very many times in the formation of speech it would certainly be very unscientific. In natural speech it is necessary to close the naso-pharyngeal opening only when it is desired to produce a forcible pressure of air through the mouth, or a full stoppage of the air, as in the expression of explosives. If it were not possible to do this at times it would be impossible for us to express the sounds which are known as explosives, such as b, t, g, and all of those consonants whose pronunciation is accomplished in that way; but in

the formation of these sounds it is necessary that the pressure shall be immediately removed and the opening again be allowed to exist, in order to produce the resonance of the other tones that is desirable. I do not think that any man who knows anything about the subject ever attempts, in the construction of an artificial palate or an obturator, to make an instrument that will completely close the naso-pharyngeal opening when the muscles are in a normal or pendant condition, but he endeavors to make an appliance that will act in conjunction with the surrounding muscles, which the patient comes in time to work almost involuntarily, the muscles so acting that they will gather in and around the artificial palate to close the opening at will. If this be not accomplished the work is a failure. In the construction of this particular instrument I have endeavored to show how the veil can be made to fit the pharyngeal walls when they are extended forward. It is by repeated trials of the models of the palate, and finally of the palate itself, that we arrive at an instrument which will enable the patient to close at will the naso-pharyngeal opening, and my object in introducing this form of palate is to obviate a difficulty that I have found in the use of the Kingsley, namely, the border of the veil is so thin that in a short time it curls up and becomes useless. By thickening the border of this veil, without giving it weight or without making it unusually stiff and rigid, a great improvement is effected. At one time I presented six patients before the Chicago Dental Society, and not only could they all speak well, but some could enunciate as perfectly as if they had no cleft palate. The result was accomplished only by the fact that they were able to work the muscles in unison with the artificial palate. I would not necessarily confine myself to this one new palate for all characters of cleft, as I would use one of hard rubber where it seemed to be called for, and in the clefts that Dr. Ottolengui refers to, which do not extend into the hard parts at all, it would be impossible to produce good results with the same kind style of appliance that could be used in other cases.

SECTION I.—Continued.

A Plea for Uniformity in the Preparation of Roots and the Construction of Bridgework.

PAPER BY C. L. HUNGERFORD, OF THE SECTION.

The most urgent need of the dental profession to-day is a positively recognized uniformity of practice as regards the more general operations, and this irrespective of personal limitations. There is no use denying that the major part of dental work consists in the application of mechanical principles that do not admit of variation, though in their exploitation the personal equation will of course determine the *quality* but not the character of the work.

I believe that the great diversity of opinion among prominent practitioners concerning many methods of practice comes chiefly from viewing the many-sided crystal of professional life from only one or two aspects, the result being a distorted vision of all facets except those directly in front of them.

A life that has been almost exclusively devoted to filling teeth does not readily lend itself to the construction of plates or the correction of deformities. No sane man in dentistry to-day would question the truthfulness of the assertion that a pulpless tooth, antiseptically filled to the apex, will remain throughout life a firm and serviceable organ; and if this desideratum is not universally obtained, it indicates that the operator lacks a special talent for this kind of work, or else is ignorant of the approved methods of accomplishing it.

It is only a very foolish man who denies to another that which he himself is unable to perform. Dentistry has reached out into the collateral sciences so far during the last decade that a man thoroughly equipped in all the departments of this profession is almost an impossibility, and if found we should be inclined to place him

upon a pedestal as an abnormality to be exhibited to the admiring multitude.

In the various methods employed in the construction of bridgework there seems to be the greatest difference of opinion among prominent practitioners concerning the fundamental principles to be followed. To instance a few examples: We hear that a sound tooth should never be cut off to make an abutment for a bridge; that one of the ends of a bridge may consist of a spur anchored into a filling, a slot, or a metal-lined groove; some use gold, some platinum, others prefer alloys, where the mathematical accuracy of the compounds seem to constitute their only virtues. Dr. A. destroys all pulps when bridges are to be attached; Dr. B. never destroys any, but prefers to allow the pulps to turn to stone of themselves; Dr. C. agrees to all that has been said, but allows only the tips of the dummies to rest against the gum, so that the tissues may not become irritated by confined secretions—he always makes a smooth, self-cleansing space next to the tongue, which after the first meal is filled flush with debris and so never needs any cleansing! Crowns are made open-faced, closed-faced, emanel-faced—each has its votaries who, devoid of design, worship without reason the idols of their fathers.

The evolution of bridgework has been the greatest achievement of modern dentistry, but it could never have come to its present perfection without the aid of the inventors of broaches, whose instruments alone have rendered it possible to construct foundations for serviceable bridges. Bridgework has been very largely decried in many sections of the country, especially in the eastern states, and this is not to be wondered at, when we consider that a serviceable and protective bridge could never be adjusted under the conditions in which it is so frequently attempted. In the old days—not so very long ago either—when the modus operandi of infection was unknown, and instruments for removal of the pulps of teeth were unobtainable, it naturally resulted that this operation was faulty and was resorted to only as a last expedient. Such is not the case to-day. Many dentists who decry this work in their speeches plainly show in their offices that they are unfamiliar with modern instruments for the purpose, or devoid of skill to use them.

When bridges are placed upon teeth with live pulps, these teeth almost without exception develop pulp-stones, with the sequelæ of

irritation, neuralgia and abscess, while the torture to the patient in grinding down and paralleling such teeth is inexcusable. When, in addition to all this, bridges are constructed in the laboratory from models made from impressions, what possible chance is there of adequate adaptation or adjustment, and with no such adjustment bridgework is of necessity worthless.

Another source of failure in bridgework is the imperfect articulation that is so generally obtained, stress being more frequently placed upon the outer than upon the inner cusps, thus tending to crowd the teeth against the weaker alveolar wall and gradually force them out of the mouth.

As regards the cutting off of two or more sound teeth for the insertion of a bridge, it is only a question of whether four or six teeth are better than two. It is often reiterated that we supply these teeth by a well adjusted partial plate. To say nothing of the annoyance of plates, these partial dentures have destroyed more sound teeth and produced more diseased and unhealthy conditions of the gums than all the pulpless teeth of the past generation ten times told. Furthermore, as regards cleanliness and health of the mucous membranes of the mouth, no plate can compare with a bridge whose gingival surface rests lightly upon the gum, and whose inner and outer walls are built out parallel with the abutments. This is sometimes called a "saddle," but as saddles would indicate pressure, and pressure leads to absorption, the gum tissue can never be made to stand as a support for a bridge. The base of all dummies must only press against the gum sufficiently tight to prevent the collection of food beneath it. Such slight secretions of mucus as occur at this place will be slowly swept out without the accumulation of foreign debris. A truly self-cleansing surface must be so shaped that the base is the broadest part, not the reverse, which is the general shape given to dummies attached to crowns. The so-called self-cleansing spaces are simply sewer-traps for food and abominations to the nostrils.

Long experience has demonstrated to the writer that open-faced crowns are more difficult to construct, show more gold, and are poorer in strength than any other form of crown, while the lack of coning of the roots, which it is impossible to do in live teeth, leaves a projecting edge of band to irritate the gums and invite a girdle of decay.

I believe there are a few fundamental points upon which the profession can unite with profit to themselves and patients, and they seem to me to be as follows: All teeth to be used as piers for bridges must be made as nearly parallel as possible, regardless of the amount of tooth structure destroyed, not only to facilitate the adjustment of the bridge, but to bring the strain against the stronger alveolar wall, and to equalize the strain upon the roots to which the bridge is attached. Every root must be entirely denuded of enamel, and so coned that the circumference shall be largest beneath the free margin of the gum. All attachments for bridges should be of the banded variety, except very rarely in the case of short bridges of anterior teeth. A saddle bridge, festooned to conform to natural teeth, is the most comfortable and cleanly form of bridgework. While a permanent bridge cannot be expected if attached to worthless roots, yet such roots will last longer carrying a bridge than without it. Gum tissues can never add anything as a support for a bridge. Articulation generally should be heaviest on the inner cusps. The majority of bands cut too deeply into the interproximal space, and do not pass far enough under the gums on the buccal or lingual sides. An accurately fitted band can never be made from an impression of any kind, but must be driven with hammer and chisel upon the root it is to clasp. Gold and platinum are the most serviceable materials to-day of which to construct bridges, though it is to be hoped that the future will bring porcelain or some allied material into more serviceable use. A swung or extended tooth is never permissible if anchored to only one root. Anchoring by spurs or extensions into fillings is always followed by loosening, friction and failure. (If anchorage is to be made after this manner, the pulp must be removed and a heavy post passed down into the canal, the coronal portion of the post constituting an inlay.) The tooth placenta or pulp should always be removed before the attachment of a crown or bridge, except perhaps in the case of very old people where nature has replaced it with secondary dentin, the tooth being without feeling, and then only when you do not expect the patient to live much longer.

I cannot refrain at this time from again calling your attention to the filthy and unscientific practice of mummifying the pulps of teeth. Of course no tooth pulp can be or ever has been mummified, but if

such a process were possible it would simply entail shrinkage of the tissue; shrinkage would leave space for the infiltration of serum and fluids loaded with their organic products that would cause soreness, disintegration and trouble, even if no infection and abscess were to follow.

Will the dental profession never learn that there is no royal short cut to mechanical perfection? Can it be that our college professors are still teaching the theories in vogue during the years of their own apprenticeship? It would look so at times. Even to-day men prominent in our profession are in search of the special bacillus of pyorrhea, when this microbe is in daily process of construction in ten thousand laboratories at five dollars apiece—"made while you wait." Along this line the following quotation from Professor Lehmann's "Atlas and Principles of Bacteriology" may not be out of place. The professor says: "In every species of bacterium which is closely studied there are found closely related forms that are not rarely represented to the unprejudiced mind that are unbroken links to other species. We certainly believe it belongs to the future to convert varieties of bacteria into others in a manner hardly imagined to-day. For medical men the division of bacteria into pathogenic (disease-producing) and non-pathogenic (innocent), as is still done in the textbooks, has failed absolutely. We can understand and know the pathogenic varieties only if we study simultaneously the non-pathogenic, from which the former have once originated and still always originate. The doctrine of the absolute consistency of bacteria, which for ten years was almost a dogma, is now hardly at all seriously advocated."

May I suggest an hypothesis which, when it becomes established, will prove the death of many reigning dogmas? It is this, that all mental conditions short of the highest, and in proportion to their distance from the highest inducing their corresponding courses of action, lead to conditions of bodily health short of the highest, and that in these conditions more and more of the ultimate vital units swerve from their proper functions and become destructive. The results of their destructive activity are in the shape of products on which existing pathogenic bacteria flourish and multiply, and on which innocent bacteria develop along malignant lines. It is along this line that one finds a rational explanation for the im-

munity from contagious diseases so frequently observed. It may presently be suspected in medical science that there is but one disease, not many, and that the seeming *many* are but the varied and classified manifestations of the *one*. A move in this direction was made more than a dozen years ago, when it was suggested that disease-producing germs came from innocent ones by feeding upon unsanitary pabulum.

Two eggs whose physical structure and chemical analysis are identical develop into different species. The seeds of the Rocky Ford when planted in Colorado and New York produce in each locality a very different quality of melon. Vice and virtue are conditions of latitude and longitude. Microbes, like men, change their habits and their skins, becoming like the osteoclasts, builders o. destroyers, according to the soil upon which they feed and the guiding principle under which they work. Dr. Snow of the London Cancer Hospital has recently stated that a very large percentage ot cancer cases, especially in women, have a distinctly traceable mental origin.

A year ago your essayist had the honor to present to this Association a paper bearing directly upon this very point; and I now rejoice to find that men eminent in the domain of bacteriology, biology and science—Professors Lehmann, Loeb, Elmer Gates of the Smithsonian Institute, and a host of others—furthering the ideas at that time expressed. The more we gather in the lines of heterogeneity in all the various fields of nature, the more we find them circling about a common center to which they are all attached, from which they derive their origin and by which they are controlled. A physiological relationship existing between the tooth and the jaw, all the rest of dentistry is purely the work of the artisan and the mechanic, requiring the highest type of human skill, ingenuity and artistic taste.

The liberal professions are never the producers—they are the thinkers of the world, and we should master the one before we commence the other. The artist alone is the doer. When we have crossed the borders of a liberal profession, we may then pass out into the great sunlight of life among the harvesters and the reapers who are intelligently working for the benefit of the race.

I have no desire to belittle any calling—every man is working in the field to which he is best fitted—but rather to raise the mechanical

and physical to the dignity to which these sciences are entitled. Let us try and rise above the narrow confines of our own little niche and recognize with Emerson—

"There is no great, no small
To the soul that seeth all;
Where it cometh, all things are;
And it cometh everywhere."

So long as the bread and butter question enters into professional work, just so long as we are compelled to fall back upon the few talents that we have developed in ourselves in our evolution from the tadpole, it is not to be wondered at that professional excellence takes the form of the groove in which it is rusting, and by which it is supported. We are inclined to do that which we can do well. We seem so helpless in other directions that our sight rarely gets above the narrow wall to which we cling. Do you wonder then that some of our teachers cling so desperately to these antiquated methods?

It is not with any great wish or expectation of converting any member of this Association to my individual views, but as a protest against some of the slovenly and inefficient methods still in vogue, that I have presented this paper. To the majority of the members of this Association, to those men among them whose attainments I honor and whose friendship honors me, I know my strictures are uncalled for; but it is to them also that I speak, for it is from them that I look for vindication and help, that the profession we follow may become a unit in practice and an honor among men.

Discussion. *Dr. J. Y. Crawford,* Nashville: This is an excellent paper, but there are two points upon which I cannot agree with the essayist. In the first place, he ignores one of the fundamental principles upon which successful dental prosthesis rests, namely, the ability of the gum to assume the function originally performed by the tooth and roots. In the second place, his statement about the devitalization of all pulps under crowns and bridges is radically wrong. The pulp presides over the welfare of the entire tooth structure and should be preserved whenever possible.

Dr. Thos. Fillebrown, Boston: I wish to say amen to Dr. Hungerford's statement with regard to the preparation of teeth for the band. Whenever a considerable portion of the enamel is removed and the greater part of the crown is covered the pulp will

die in a short time, so in all such cases it should be devitalized and removed. I wish also to agree with the statement that a tooth should be trimmed down until the circumference is largest at the margin of the gum. Occasionally a patient will present who is unable to bear the necessary grinding. In such cases a pure gold cap, reaching about half way to the gum, may be burnished on the crown so as to fit closely. The pulp of a tooth treated in this way will remain healthy.

Dr. J. N. Crouse, Chicago: In teeth which are not bell-shaped, but which grow larger toward the gum, I should trim but little, and I should not destroy the pulp unless it were absolutely necessary. If rightly treated I do not think so many of them will die as we imagine. I should rather take chances on its living than to cut the tooth down and have the root lost sooner or later, and usually sooner than later. In my scrap heap I have a large number of bridges, where the wisdom tooth, roots and all, is cemented fast in the cap, and where the whole business was easily taken out by hand, although the bridge had been well made and well fitted. I have never been able to quite decide what makes the pulp die in a tooth which has been cut down, but believe the acid in the cement has considerable to do with it. I should save the pulp wherever possible, but of course there are cases where it must be removed. One of these is where the patient is advanced in life. There is one operation which I am always reluctant to perform, and that is to cut off a sound cuspid tooth, especially for a woman, in order to use the root as the abutment for a bridge, yet it is the proper thing to do. I have made a good many open-faced crowns, but the more I see of them the less I like them.

Dr. G. V. Black, Chicago: In addition to what Dr. Crouse has said about putting crowns on teeth with live pulps, I would state that this has been my practice for years, but it has been done with judgment. Right here I must enter an objection to this excellent paper. While it is true that applied physics is a large factor in all dental work, and especially in placing crowns and bridges, we must not use it without exercising judgment as to the present or future conditions of a pathological character due to the application of this work. Our knowledge of pathology, of disease, and of the conditions that are likely to produce it, should precede and control. The

paper tends to diminish our faith in well-known bacteriological facts. While there are changes taking place in all living things, the species of microorganisms are as constant as those of almost any other varieties of life, and the essayist's endeavor to show that there is no constancy in the various species of microorganisms seems entirely wrong to me.

Dr. D. R. Stubblefield, Nashville: It is an indisputable fact that all bridgework is against nature, and we should therefore not be surprised when there are compromises on the part of nature under the circumstances under which she labors. Bridgework is in many respects the ideal compromise of the profession with untoward existing conditions, and I heartily approve of it, but when you put four teeth on a foundation which nature used for two, you have overloaded her and must not hope for ideal results. The essayist failed to state that his paper is a Utopian dream, but we should have such things, for there never was a grand practical result that was not preceded by a dream. So long as we hope for universal efforts we dream, and we waste time when we try to force all others into our line of operating rather than to impress upon them the ideals at which they are to aim.

Dr. R. H. Hofheinz, Rochester, N. Y.: I should say that a fact was never proven without a fight, especially in dental societies. If Dr. Hungerford stated that he destroyed the pulp under all conditions whenever putting on a bridge, I should say that it was a radical mistake, but I did not so understand him. I thought he stated that he would under all conditions destroy the pulp where it was necessary to secure mechanically correct foundations for his bridgework, rather than endeavor to keep the pulp alive for a short time and have an imperfect foundation. I accord in that statement. However, to my mind the principal idea of this paper is not the destruction of the pulp or the application of the band in bridgework, but something much greater. The essayist speaks of uniformity, and alludes to the broad-mindedness of professional men. Generally speaking, if there were uniformity there would be absolutely no progress, as it is only the difference of opinion that leads to progress and to the acceptance of the best method of doing certain things. The fundamental principles of bridgework which he has laid down so excellently seem as clear as possible,

yet we all frequently see cases where these primary laws have been neglected. As to broad-mindedness among our professional men, we must not forget that the very fact of living in this age of specialization means narrow-mindedness to a certain degree. This is largely applicable to dentists, and they more than any other professional men, owing to the long confinement in their offices, ought to do everything possible to exercise their minds beyond their special work. It is largely owing to a smallness of conception that so much of what is said and written at the present time passes away without effect.

Dr. J. D. Patterson, Kansas City: If anyone thinks Dr. Hungerford has given us a Utopian idea or that he is a dreamer, I wish to say that there are many in the west dreaming the same dream and carrying out the same idea. I am astonished at Dr. Black's remarks, which seem to indicate that the principles laid down and accepted in the last decade upon bacteriology shall not be improved upon in the next. This is a subject about which we know very little, and opinions are changing from year to year as investigations proceed. There will probably be more change in the future in our ideas as to the biology of bacteria and their action in pathological conditions than in almost any field of science. Every word that Dr. Hungerford has said represents the most advanced ideas upon that subject, and anyone can prove his statements by studying the conclusions of the most eminent biologists and bacteriologists of the present time.

Dr. J. E. Wilkinson: Dr. Hungerford makes a valuable point when he says that the outer cusps should not have as much strain put upon them as the inner ones in the articulation, because of the weaker buccal alveolar wall. Of course if we make a greater slope, so as to have more pressure on the inner cusps, then instead of having a pressure at the margin of the alveolus we will have a greater pressure of the apical end against the buccal alveolus. The essayist seems to object strongly to partial plates. Some one stated that all bridgework was against nature, and in like manner all partial dentures are against nature, but there are cases where they do more good and cause less injury than bridges. I do not agree with Dr. Hungerford's statement that swung dummies should not be attached to single roots, as there are cases where this can be done.

Take, for example, an upper first bicuspid, with the second bicuspid missing and no tooth below to occlude. A dummy could certainly be inserted there, or even if there were a tooth below, a dummy without an occluding surface might be used to greater advantage than a single tooth on a plate. The statement was also made that weak roots could be retained longer in the mouth by the application of a bridge than without. I would agree with that to a slight extent, and if a crown of some kind having an occluding surface were inserted with those roots, functional activity could be better restored and they could be retained longer.

Dr. M. R. Cox, Portland, Ore.: As it has been stated that the west believes in the almost universal destruction and removal of pulps, I wish to enter my protest. As regards the removal of the enamel of a tooth which is to be used as an abutment, I think that if the tooth bulges in the center it is much better to let the cap reach only to the greatest circumference of the tooth than to remove all the enamel to admit of adaptation at the gingival border. The plea for uniformity of action in this paper disproves to my mind the idea of the general extirpation of the pulp. There are probably not more than a dozen here who employ the same method in the treatment and filling of root canals, which goes to show that all of us recognize the untoward results from this operation.

Dr. M. L. Rhein, New York: I agree with Dr. Patterson that the beliefs concerning bacteriology and pathology must for years to come be tentative, and the scientific world to-day recognizes the fact that we must be ready to change our views at any moment in accordance with new discoveries. I do not believe that Dr. Hungerford places himself in an attitude where he fails to see the different conditions that may present in practice, but the point that he has brought up so clearly is one that is becoming a byword to American dentistry, namely, the abuse of crown and bridgework. We recognize the value of these aids, but when a crown is placed over a tooth that could be filled without danger to the pulp, or where a bridge is put on in a case where the root could be restored, or when the work is done years before there is any necessity for it, American dentistry is disgraced. It is time the ethical men of the profession and the dental associations should adopt some means to put a stop to this wholesale destruction of teeth.

I say unhesitatingly that when a tooth must be crowned it should be properly prepared, and Dr. Hungerford has outlined the method. Our scientific work has failed thus far to show us the pathological conditions that exist in the pulp from the time of the first attack in a slight form of pulpitis. Dental investigators are just beginning to tell us what stages precede the seed-like deposits that we find in certain pulps when removed. We should remember that these operations are permissible at a time when, owing to the age of the patient, the formative period of the teeth has ceased. I do not underrate the disadvantage of removing a pulp from any tooth, but it is the lesser of two evils. We all know the result of placing a gold cap over a tooth from which the enamel has been removed, and before the dentin is covered with a substance which by its thermal action permits free passage of outside influences the pulp should be removed. I disagree with Dr. Cox on the subject of root treatment, for if clinical dentistry has accomplished one thing in the last twenty years it has enabled us to treat and fill roots in a fairly uniform and scientific manner.

Dr. James McManus, Hartford, Conn.: Dr. Black touched the vital point when he stated that all these operations should be performed with judgment. I do not doubt that Dr. Crouse has a large collection of bridges that were failures, and I suppose every dentist of considerable practice has many such. These bridges were failures because they were put on by men without judgment, without care, without ability—in fact, without anything except the desire to do something that looked like dentistry. We should never insert a bridge without studying well the models and the articulation. If this were done crown and bridge work would not be the disgrace to the profession that they are to-day.

Dr. J. P. Root, Kansas City: A year ago I read a paper before one of the sections of this Association along this same line. I claimed, as does Dr. Hungerford, that in all crowned teeth the pulp should be destroyed, except occasionally in the case of bridge attachments, but I further say that with rare exceptions no tooth should be crowned where there is a chance to fill. Where it is not necessary to destroy the pulp the tooth does not require a crown, and when we all learn to practice what some of us preach there will be no occasion for so much useless discussion of this subject.

Dr. Emory A. Bryant, Washington: Dr. Hungerford argues that a man must eliminate his personality and work along one line, but this is a practical impossibility. I cannot comprehend where these men get the idea that the pulp must be destroyed in every tooth that is crowned. They remind me of the men who run down bridgework and say, "You destroy the living tissue when you crown the tooth," but who advocate the use of a pair of forceps to prepare the same mouth for a plate. They decry bridgework because in some cases there is resulting filth, but the same men will put in a rubber plate, which is the filthiest thing in the world. Why is it that the man who advocates removal of the pulp in crowning operations will hammer away for four or five hours on a large contour filling which contains more gold than a crown. The thermal action is greater in that filling than in the crown, because it is closer to the pulp. The same man will advocate a porcelain filling to avoid a show of gold. It is not the gold upon the surface of the tooth that kills the pulp, but the phosphoric acid in the cement, and why would the acid not have the same effect when used to set a large porcelain filling? I do not believe that we must bind ourselves to any one method in crown and bridgework. Our work should be an art as far as possible, but our first duty is to give our patients the greatest amount of satisfaction and the best service. When necessary we should sacrifice art for strength and utility. I have no faith in this gingerbread work, but believe in putting something in the mouth that will remain there.

Some men have taken exception to the self-cleansing surfaces of bridgework. A few years ago Dr. Rhein invented a system of removable bridgework, but I have not heard of it since. As regards the self-cleaning surfaces of teeth in bridgework, if the bridge is constructed as it should be, with due reference to all the tissues, it cannot help but be perfect in its action. The trouble is that the majority of dentists do not open the bite in a case of abnormal articulation, but accept the mouth in the condition in which they receive it, and put in a bridge on one side without changing the bite on the other, although the bite may be very close. They cannot do this without inflaming the tissues and making the bridge a receptacle for filth. If you will open the bite and restore the mouth to its original condition you will obtain a self-cleansing surface. I

have one patient who will not keep his teeth clean and you cannot see the bridge therein for the filth.

Dr. F. B. Noyes, Chicago: The human mind has a tendency to swing from one extreme to another, and we are apt to think that a single new fact disproves everything previous. On the contrary, in the scientific world there are few revolutions and there is a continuity in the development of thought. Each fact discovered takes its harmonious place with what has preceded it. Heterogenesis as a biological fact was disproven long ago. There is nothing more fundamental in biology to-day than the universal law of heredity, namely, that all living things are derived from similar living parents. A correlative with this fact is the law of variation—that no living thing exactly resembles either of its parents. Up to the last decade the study of bacteriology was concerned with the identification of species and their relation to certain diseases, which latter has been proven. In the future we shall not overthrow those beliefs, but will study the modification of the species by its environment. Bacteria resemble other organized things in that their environment affects their functions. Biologists to-day recognize that all the phenomena of life presented through the cellular organization are but exalted chemical reactions, and that these reactions are dependent upon the reagents present. By changing the food of a poisonous snake its secretions may cease to be venomous, but give it again its proper food—restore its natural environment—and its bite will be as poisonous as ever. The same thought applies in bacteriology. Certain germs produce given diseases under certain conditions, but not under others, but it cannot be proven that tetanus bacilli can produce tuberculosis. The same disease may be produced by different germs, and the same germs may under varying conditions produce what are recognized as two diseases, for instance, croup and diphtheria, pulmonary pneumonia and pericarditis, but that does not annihilate the identity of species nor establish heterogenesis in biology.

Dr. N. S. Hoff, Ann Arbor, Mich.: In substance the essayist stated that a man who has habitually followed one line of work, such as operative dentistry, is thereby disqualified to mutilate the teeth for the proper adaptation of bridgework. Some have further stated that not only are artistic ideals to be wholly set aside in making

crowns and bridges, but also many of the physiological principles upon which they should be constructed are to be subordinated to mechanical rules. It seems to me that the artistic aspect of this subject should be given its due proportion of consideration. I cannot bring myself to mutilate or destroy tooth structure for the purpose of making some particular form of bridgework. I believe in bridgework and think it should be made as substantial as possible, but that is not the paramount issue at stake—rather the artistic restoration of the existing conditions. This attitude, as the essayist has indicated, may come from my training as an operator or as a conservator of the dental organs. This discussion has emphasized the fact, as stated by Dr. Black, that we must use judgment in all crown and bridgework, and has given us one of the strongest possible arguments for broader culture—a culture which will make every man who undertakes any operation in dentistry the possessor of a judgment which will enable him to at least approximate the best results. Such judgment cannot be obtained by adopting the ideas of any one man or by looking at the matter only from the mechanical, the physiological or the artistic aspect.

Dr. Black: For the last ten years there has been a great effort among bacteriologists to trace the changes presented by those forms of microorganisms which show variations in form or function, and it has been found that there are many germs which present some of the characteristics of insect life, appearing first in one, then in another, next in a third form, and then repeating the cycle. The work and the conclusions seem to have been taken by some to indicate that the forms of microorganisms are uncertain, but the conclusions reached up to the present time determine the fact that these germs, although changing in their character, are still as reasonably certain as are other forms of life.

Dr. A. J. Flanagan, Springfield, Mass.: The fundamental principle of bridgework is that we are dealing with live and not immovable objects. Men who can make a beautiful bridge on a dummy case cannot necessarily do as well in the mouth. As I understand it, the question reverts to the statement made three years ago by Dr. Hungerford, namely, that it is better to remove the pulp with the tooth in a normal condition than to defer the operation until it is forced upon us by abnormal conditions. This statement has never

been refuted. As regards crowns causing death of the pulp, these questions arise: First, is it caused by grinding down the tooth? Second, is it caused by the medium with which the crown is set? Third, is it caused by a pathological condition outside these mentioned? Before we can arrive at any conclusion as to the best method to be adopted in crown and bridgework we must ascertain definitely what causes death of the pulp.

Dr. Rhein: Dr. Bryant spoke about a form of removable bridgework which I devised. It was never my intention to introduce it as something which should become a system, but it was intended to take the place of the sort of bridgework that he mentioned, where the bridge could not be seen because of the filth covering it. The form of bridgework which I introduced has been used by a number of men, and from the principles then elucidated the Griswold system has been evolved. Proper judgment should be used in determining whether a fixed or removable bridge should be inserted. Dr. Bryant certainly condemned himself when stating that he put a fixed bridge in the mouth of a patient who would not keep it in a sanitary condition.

Dr. G. D. Sitherwood, Bloomington, Ill.: Bacteriologists tell us that certain germs are always present in the mouth, and that under given conditions they become pathological and do harm, so Dr. Hungerford has advocated this particular style of bridgework, not only for mechanical and other reasons, but so that no lodgment will be afforded for debris that will feed these germs and cause them to become pathological. Dr. Hungerford did not set forth a specific plan for making bridges, but he laid down universal principles that we should all recognize and work out in our own individual way.

Dr. Crouse: I consider the cause of failure in bridgework to be the loss of the peridental membrane. This is what makes bridges come out with the roots and all attached, and anything that will obviate this inflammation and loss of tissue should be looked into.

Dr. Bryant: In answer to Dr. Rhein, I have done something myself in the line of removable bridgework, and as regards the patient with a filthy mouth, the same trouble existed with a removable as with a permanent bridge, for he would not take out the removable bridge to clean it.

Dr. A. C. Hewett, Chicago: We can all earn a lesson by looking

at the three bridges which span the Niagara river. One is a suspension, another a cantilever, and the third an arch. The engineers who planned them knew exactly what was needed at the various points; also what would best meet the needs, and each bridge is doing its work perfectly. It would be senseless to make them all alike or to substitute one for another. It is just as senseless to say that all bridges in the mouth must be made just the same and upon the same principles. So long as there are differences in the teeth, gums and alveolar processes upon which we operate, so long there must be differences in the structures which we build and the methods we employ. We might just as well plead for uniformity in the shapes of fillings as for the uniformity in bridges.

Dr. S. W. Foster, Atlanta, Ga.: The cause of many failures in bridgework is the irritation of the periosteal lining of the roots by the edge of the crown impinging upon the gingival margin and periosteum. Frequently we do not use sufficient care in shaping the edge of the crown which goes below the gum line. I am strongly in favor of retaining the pulp in its normal, vital condition as long as possible, but if we adopt the essayist's statement that in preparing abutments all the lines must be parallel, we must devitalize the pulp much more frequently than where inclined planes are used. It is a principle in mechanics that two approaching inclines are stronger than two parallels, and in many cases, especially with the second and third molars, better results are obtained from inclines than from parallels.

Dr. Hungerford, closing discussion: In no great movement of science or industry can you expect to find all your confreres broad-minded. The surest sign of progress is when you can be kindly disposed toward those who are opposed to you, and an infallible indication of retrogression is when you expect every man to think and act as you do. It would take a week for me to answer all the points that have been brought up, and as my advocates and opponents have been about equal in numbers I will leave the matter to you for settlement. However, there was not the appreciation of the effort which I made in pleading for uniformity that I hoped for. It is well recognized in medicine that while one physician may prescribe quinin, another phenacetin, and a third antifebrin, all agree that in certain diseases antipyretics are necessary, and those

die in a short time, so in all such cases it should be devitalized and removed. I wish also to agree with the statement that a tooth should be trimmed down until the circumference is largest at the margin of the gum. Occasionally a patient will present who is unable to bear the necessary grinding. In such cases a pure gold cap, reaching about half way to the gum, may be burnished on the crown so as to fit closely. The pulp of a tooth treated in this way will remain healthy.

Dr. J. N. Crouse, Chicago: In teeth which are not bell-shaped, but which grow larger toward the gum, I should trim but little, and I should not destroy the pulp unless it were absolutely necessary. If rightly treated I do not think so many of them will die as we imagine. I should rather take chances on its living than to cut the tooth down and have the root lost sooner or later, and usually sooner than later. In my scrap heap I have a large number of bridges, where the wisdom tooth, roots and all, is cemented fast in the cap, and where the whole business was easily taken out by hand, although the bridge had been well made and well fitted. I have never been able to quite decide what makes the pulp die in a tooth which has been cut down, but believe the acid in the cement has considerable to do with it. I should save the pulp wherever possible, but of course there are cases where it must be removed. One of these is where the patient is advanced in life. There is one operation which I am always reluctant to perform, and that is to cut off a sound cuspid tooth, especially for a woman, in order to use the root as the abutment for a bridge, yet it is the proper thing to do. I have made a good many open-faced crowns, but the more I see of them the less I like them.

Dr. G. V. Black, Chicago: In addition to what Dr. Crouse has said about putting crowns on teeth with live pulps, I would state that this has been my practice for years, but it has been done with judgment. Right here I must enter an objection to this excellent paper. While it is true that applied physics is a large factor in all dental work, and especially in placing crowns and bridges, we must not use it without exercising judgment as to the present or future conditions of a pathological character due to the application of this work. Our knowledge of pathology, of disease, and of the conditions that are likely to produce it, should precede and control. The

paper tends to diminish our faith in well-known bacteriological facts. While there are changes taking place in all living things, the species of microorganisms are as constant as those of almost any other varieties of life, and the essayist's endeavor to show that there is no constancy in the various species of microorganisms seems entirely wrong to me.

Dr. D. R. Stubblefield, Nashville: It is an indisputable fact that all bridgework is against nature, and we should therefore not be surprised when there are compromises on the part of nature under the circumstances under which she labors. Bridgework is in many respects the ideal compromise of the profession with untoward existing conditions, and I heartily approve of it, but when you put four teeth on a foundation which nature used for two, you have overloaded her and must not hope for ideal results. The essayist failed to state that his paper is a Utopian dream, but we should have such things, for there never was a grand practical result that was not preceded by a dream. So long as we hope for universal efforts we dream, and we waste time when we try to force all others into our line of operating rather than to impress upon them the ideals at which they are to aim.

Dr. R. H. Hofheinz, Rochester, N. Y.: I should say that a fact was never proven without a fight, especially in dental societies. If Dr. Hungerford stated that he destroyed the pulp under all conditions whenever putting on a bridge, I should say that it was a radical mistake, but I did not so understand him. I thought he stated that he would under all conditions destroy the pulp where it was necessary to secure mechanically correct foundations for his bridgework, rather than endeavor to keep the pulp alive for a short time and have an imperfect foundation. I accord in that statement. However, to my mind the principal idea of this paper is not the destruction of the pulp or the application of the band in bridgework, but something much greater. The essayist speaks of uniformity, and alludes to the broad-mindedness of professional men. Generally speaking, if there were uniformity there would be absolutely no progress, as it is only the difference of opinion that leads to progress and to the acceptance of the best method of doing certain things. The fundamental principles of bridgework which he has laid down so excellently seem as clear as possible,

yet we all frequently see cases where these primary laws have been neglected. As to broad-mindedness among our professional men, we must not forget that the very fact of living in this age of specialization means narrow-mindedness to a certain degree. This is largely applicable to dentists, and they more than any other professional men, owing to the long confinement in their offices, ought to do everything possible to exercise their minds beyond their special work. It is largely owing to a smallness of conception that so much of what is said and written at the present time passes away without effect.

Dr. J. D. Patterson, Kansas City: If anyone thinks Dr. Hungerford has given us a Utopian idea or that he is a dreamer, I wish to say that there are many in the west dreaming the same dream and carrying out the same idea. I am astonished at Dr. Black's remarks, which seem to indicate that the principles laid down and accepted in the last decade upon bacteriology shall not be improved upon in the next. This is a subject about which we know very little, and opinions are changing from year to year as investigations proceed. There will probably be more change in the future in our ideas as to the biology of bacteria and their action in pathological conditions than in almost any field of science. Every word that Dr. Hungerford has said represents the most advanced ideas upon that subject, and anyone can prove his statements by studying the conclusions of the most eminent biologists and bacteriologists of the present time.

Dr. J. E. Wilkinson: Dr. Hungerford makes a valuable point when he says that the outer cusps should not have as much strain put upon them as the inner ones in the articulation, because of the weaker buccal alveolar wall. Of course if we make a greater slope, so as to have more pressure on the inner cusps, then instead of having a pressure at the margin of the alveolus we will have a greater pressure of the apical end against the buccal alveolus. The essayist seems to object strongly to partial plates. Some one stated that all bridgework was against nature, and in like manner all partial dentures are against nature, but there are cases where they do more good and cause less injury than bridges. I do not agree with Dr. Hungerford's statement that swung dummies should not be attached to single roots, as there are cases where this can be done.

Take, for example, an upper first bicuspid, with the second bicuspid missing and no tooth below to occlude. A dummy could certainly be inserted there, or even if there were a tooth below, a dummy without an occluding surface might be used to greater advantage than a single tooth on a plate. The statement was also made that weak roots could be retained longer in the mouth by the application of a bridge than without. I would agree with that to a slight extent, and if a crown of some kind having an occluding surface were inserted with those roots, functional activity could be better restored and they could be retained longer.

Dr. M. R. Cox, Portland, Ore.: As it has been stated that the west believes in the almost universal destruction and removal of pulps, I wish to enter my protest. As regards the removal of the enamel of a tooth which is to be used as an abutment, I think that if the tooth bulges in the center it is much better to let the cap reach only to the greatest circumference of the tooth than to remove all the enamel to admit of adaptation at the gingival border. The plea for uniformity of action in this paper disproves to my mind the idea of the general extirpation of the pulp. There are probably not more than a dozen here who employ the same method in the treatment and filling of root canals, which goes to show that all of us recognize the untoward results from this operation.

Dr. M. L. Rhein, New York: I agree with Dr. Patterson that the beliefs concerning bacteriology and pathology must for years to come be tentative, and the scientific world to-day recognizes the fact that we must be ready to change our views at any moment in accordance with new discoveries. I do not believe that Dr. Hungerford places himself in an attitude where he fails to see the different conditions that may present in practice, but the point that he has brought up so clearly is one that is becoming a byword to American dentistry, namely, the abuse of crown and bridgework. We recognize the value of these aids, but when a crown is placed over a tooth that could be filled without danger to the pulp, or where a bridge is put on in a case where the root could be restored, or when the work is done years before there is any necessity for it, American dentistry is disgraced. It is time the ethical men of the profession and the dental associations should adopt some means to put a stop to this wholesale destruction of teeth.

the United States. He died in 1852, but not before he had seen his educational reform work an accepted truth. Spencer in 1861 produced his work on "Education" and paved the way for a rational education. La Conte, Tyndall, Quick, Haeckel, Painter, Bain and many others have followed along similar lines. The time is now passed when the training of the mind alone constitutes education in its best form. To be sure, there are people in the so-called higher (?) society of the world who consider the use of the hands in life work as not only a low form of education but also as ungentlemanly. The older days of dentistry produced a practitioner second to none in technical ability. And why? Many started young to learn mechanics of some kind and drifted into dentistry, while others served a long apprenticeship under a good instructor. In the words of Dr. C. T. Stockwell of Springfield, Mass., "The laboratory was his throne and his college; and here he toiled faithfully and well, and wrought out the very foundation of the superstructure which we pride ourselves in calling modern dentistry."

Those old days are gone never to return, and I am optimistic enough to believe it is for the best. But is there no underlying fundamental to grasp from their past experience in dental education? Is it not this, that we must gain our technical or mechanical dexterity before entering college? If we are to produce scientific practitioners we must at the present time take up manual training in conjunction with selected studies. The United States to-day stands second to Germany in manual training ideas and facilities, and the time seems ripe for dentistry to start a course in the various public schools suitable for the higher development of the mind and hand along the lines of preliminary dental education. We have people who are color-blind and tone-deaf, and may we not safely say many are and always will be mechanically or technically "dense?" Where is the better place to discover this? Is it not in the preliminary school rather than in the college? In fact, is not the greatest need of our present educational system of dentistry some reasonable way of "dropping" these technically imperfect students?

We hear many decry the setting up of a system of dental education apart from the medical men, claiming that dentistry is a specialty of medicine, and that our calling will never be what it should be until we have the title of M.D. Has medicine such a mort-

gage on the knowledge essential to our advancement that we will have to go to her to obtain it? Perhaps it is the degree and not the knowledge that is needed for our advancement. To those who think this degree is essential all respect is due, but they seem to forget that this is the age of all knowledge to the end of the best dental training. We need no extra degrees, but we do need any knowledge that will lead to higher and better dentistry. The future will surely evolve the fact that when we enter a dental college it is for a specific course, and that many of the studies we now take up in college will have been mastered in our preliminary colleges—the public common and high schools of technical training. As yet we are but on the border line of technical education, and the future will surely surprise us.

The literature pertaining to dental education has of late brought forth valuable and pointed thoughts from men teaching dentistry in our colleges, and it is easy to discern that the material furnished them is not entirely satisfactory, and that the future welfare of our calling will surely demand a change in the present so-called preliminary requirements. Have we not worshipped long enough at the altar of the "false god" of the "other fellow?" Is not the time at hand for a change?

Discussion. *Dr. G. V. I. Brown,* Milwaukee: I would correct an impression given by this paper concerning the preliminary requirements of the National Association of Dental Faculties with regard to students, which is not in accord with the present state of affairs, because such preliminary examination is now in the hands of the state superintendent or the highest authority in education in the particular state in which the college happens to be situated, and it is not in the somewhat lax condition that the paper represents it to be.

Dr. E. A. Bryant, Washington: To a great degree I concur in the ideas expounded by the essayist. The main thought of this valuable paper may be said to center in manual training as a preliminary to the study of dentistry, and to that feature I subscribe, providing the present "medico-dental" methods of teaching are to be relegated to the rear. Let me read an extract from a letter of Dr. Kirk's which was read at the last congress—"To my great surprise I have observed that the number of those who fail in their yearly examinations has increased in proportion to the increase in the entrance ex-

have one patient who will not keep his teeth clean and you cannot see the bridge therein for the filth.

Dr. F. B. Noyes, Chicago: The human mind has a tendency to swing from one extreme to another, and we are apt to think that a single new fact disproves everything previous. On the contrary, in the scientific world there are few revolutions and there is a continuity in the development of thought. Each fact discovered takes its harmonious place with what has preceded it. Heterogenesis as a biological fact was disproven long ago. There is nothing more fundamental in biology to-day than the universal law of heredity, namely, that all living things are derived from similar living parents. A correlative with this fact is the law of variation—that no living thing exactly resembles either of its parents. Up to the last decade the study of bacteriology was concerned with the identification of species and their relation to certain diseases, which latter has been proven. In the future we shall not overthrow those beliefs, but will study the modification of the species by its environment. Bacteria resemble other organized things in that their environment affects their functions. Biologists to-day recognize that all the phenomena of life presented through the cellular organization are but exalted chemical reactions, and that these reactions are dependent upon the reagents present. By changing the food of a poisonous snake its secretions may cease to be venomous, but give it again its proper food—restore its natural environment—and its bite will be as poisonous as ever. The same thought applies in bacteriology. Certain germs produce given diseases under certain conditions, but not under others, but it cannot be proven that tetanus bacilli can produce tuberculosis. The same disease may be produced by different germs, and the same germs may under varying conditions produce what are recognized as two diseases, for instance, croup and diphtheria, pulmonary pneumonia and pericarditis, but that does not annihilate the identity of species nor establish heterogenesis in biology.

Dr. N. S. Hoff, Ann Arbor, Mich.: In substance the essayist stated that a man who has habitually followed one line of work, such as operative dentistry, is thereby disqualified to mutilate the teeth for the proper adaptation of bridgework. Some have further stated that not only are artistic ideals to be wholly set aside in making

crowns and bridges, but also many of the physiological principles upon which they should be constructed are to be subordinated to mechanical rules. It seems to me that the artistic aspect of this subject should be given its due proportion of consideration. I cannot bring myself to mutilate or destroy tooth structure for the purpose of making some particular form of bridgework. I believe in bridgework and think it should be made as substantial as possible, but that is not the paramount issue at stake—rather the artistic restoration of the existing conditions. This attitude, as the essayist has indicated, may come from my training as an operator or as a conservator of the dental organs. This discussion has emphasized the fact, as stated by Dr. Black, that we must use judgment in all crown and bridgework, and has given us one of the strongest possible arguments for broader culture—a culture which will make every man who undertakes any operation in dentistry the possessor of a judgment which will enable him to at least approximate the best results. Such judgment cannot be obtained by adopting the ideas of any one man or by looking at the matter only from the mechanical, the physiological or the artistic aspect.

Dr. Black: For the last ten years there has been a great effort among bacteriologists to trace the changes presented by those forms of microorganisms which show variations in form or function, and it has been found that there are many germs which present some of the characteristics of insect life, appearing first in one, then in another, next in a third form, and then repeating the cycle. The work and the conclusions seem to have been taken by some to indicate that the forms of microorganisms are uncertain, but the conclusions reached up to the present time determine the fact that these germs, although changing in their character, are still as reasonably certain as are other forms of life.

Dr. A. J. Flanagan, Springfield, Mass.: The fundamental principle of bridgework is that we are dealing with live and not immovable objects. Men who can make a beautiful bridge on a dummy case cannot necessarily do as well in the mouth. As I understand it, the question reverts to the statement made three years ago by Dr. Hungerford, namely, that it is better to remove the pulp with the tooth in a normal condition than to defer the operation until it is forced upon us by abnormal conditions. This statement has never

been refuted. As regards crowns causing death of the pulp, these questions arise: First, is it caused by grinding down the tooth? Second, is it caused by the medium with which the crown is set? Third, is it caused by a pathological condition outside these mentioned? Before we can arrive at any conclusion as to the best method to be adopted in crown and bridgework we must ascertain definitely what causes death of the pulp.

Dr. Rhein: Dr. Bryant spoke about a form of removable bridgework which I devised. It was never my intention to introduce it as something which should become a system, but it was intended to take the place of the sort of bridgework that he mentioned, where the bridge could not be seen because of the filth covering it. The form of bridgework which I introduced has been used by a number of men, and from the principles then elucidated the Griswold system has been evolved. Proper judgment should be used in determining whether a fixed or removable bridge should be inserted. Dr. Bryant certainly condemned himself when stating that he put a fixed bridge in the mouth of a patient who would not keep it in a sanitary condition.

Dr. G. D. Sitherwood, Bloomington, Ill.: Bacteriologists tell us that certain germs are always present in the mouth, and that under given conditions they become pathological and do harm, so Dr. Hungerford has advocated this particular style of bridgework, not only for mechanical and other reasons, but so that no lodgment will be afforded for debris that will feed these germs and cause them to become pathological. Dr. Hungerford did not set forth a specific plan for making bridges, but he laid down universal principles that we should all recognize and work out in our own individual way.

Dr. Crouse: I consider the cause of failure in bridgework to be the loss of the peridental membrane. This is what makes bridges come out with the roots and all attached, and anything that will obviate this inflammation and loss of tissue should be looked into.

Dr. Bryant: In answer to Dr. Rhein, I have done something myself in the line of removable bridgework, and as regards the patient with a filthy mouth, the same trouble existed with a removable as with a permanent bridge, for he would not take out the removable bridge to clean it.

Dr. A. C. Hewett, Chicago: We can all earn a lesson by looking

at the three bridges which span the Niagara river. One is a suspension, another a cantilever, and the third an arch. The engineers who planned them knew exactly what was needed at the various points; also what would best meet the needs, and each bridge is doing its work perfectly. It would be senseless to make them all alike or to substitute one for another. It is just as senseless to say that all bridges in the mouth must be made just the same and upon the same principles. So long as there are differences in the teeth, gums and alveolar processes upon which we operate, so long there must be differences in the structures which we build and the methods we employ. We might just as well plead for uniformity in the shapes of fillings as for the uniformity in bridges.

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Dr. Hungerford, closing discussion: In no great movement of science or industry can you expect to find all your confreres broad-minded. The surest sign of progress is when you can be kindly disposed toward those who are opposed to you, and an infallible indication of retrogression is when you expect every man to think and act as you do. It would take a week for me to answer all the points that have been brought up, and as my advocates and opponents have been about equal in numbers I will leave the matter to you for settlement. However, there was not the appreciation of the effort which I made in pleading for uniformity that I hoped for. It is well recognized in medicine that while one physician may prescribe quinin, another phenacetin, and a third antifebrin, all agree that in certain diseases antipyretics are necessary, and those

diseases are well established. As a profession we should unite upon certain standards and say when certain operations should or should not be performed. Until we can do so our practice of necessity will be more or less empirical.

I believe that most bridges are lost because of periostitis, and I think that fifty per cent of the diseases of the periosteum could be prevented if the teeth were deprived of their placenta after they are born. When the pulp has fulfilled its normal function of depositing dentin it ceases to perform any further physiological action. After the tooth has grown the pulp is as useless as the enamel membrane, but fortunately for the individual the latter is worn off shortly after the tooth is erupted. The pulp, on the other hand, remains on the inside until some dentist irritates the terminals of the fibers either chemically or mechanically, when it makes a more determined effort to eradicate itself, and in that effort dies, and through continuity of structure, irritation and loss of the peridental membrane naturally follow.

It seemed to me that Dr. Noyes took both sides with reference to the biology of bacteria. How is it possible to believe in the consistency of bacteria or of any class of living things if you believe in evolution, for the germs must change with their environment and under the conditions in which they live, and where they are hampered in their growth they must undergo changes. If there was one thing that I especially emphasized it was the idea that these new theories, while perhaps not thoroughly true, are worthy of our most earnest consideration. Dr. Black does not like to hear any new theories promulgated that will tend to disrupt the profession. If the new ideas are true they will not disrupt the profession and we want to know them, and if they are false we shall soon find it out. There is such a thing as clinging to old methods because we do not know anything else, and because we have journeyed so far along one line that the dust of the road has blinded us and so clogged our wheels that we cannot bend our energies to the newer things.

SECTION II.

Dental Education, Literature, Nomenclature, Histology and Microscopy.

Some Thoughts on the So-Called "Preliminary Requirements."

PAPER BY A. J. FLANAGAN, OF THE SECTION.

For some years there has been a seeming unrest in educational matters of all kinds, and this may well be considered from many points of reasoning as being simply in harmony with the world's evolution in general—an evolution which has progressed from the beginning and which we may well hope is to continue for all time. This evolution of educational thought and method must necessarily have a cause, and the discovery of a cause is the beginning of a rational and logical system of betterment. Time was when education concerned but a fraction of this world's population, for we were then in what might well be termed the constructive or bare living stage, but as changing conditions brought us up from this period we had the time and means for something beyond a mere existence. The older countries have been beyond this mere existence stage for some time, but we here in America are only emerging from it, yet coming forth in such strength and numbers that the world stands aghast at the shadow cast before. America to-day is the center of the greatest interest in all that which may be classed under educational advancement for a specific purpose. The present sees us taking the fundamentals of the past and present of the old world's brightest minds and transplanting them into an entirely new environment, with results that other countries are beginning to admit if they do not understand. In a broad sense we can divide educational

thought into two fields: 1st. That which is represented by the United States; 2d. All outside the United States. Of course, in a strict sense objections can be made to this division, but in a general way it will stand the test. The one great cause for this division is, that all that which makes up our system of government is arrayed in a general way against the many systems outside this country.

Dentistry has been keeping apace with the world's advancement along the lines of education, and this progression has brought forth varying ideas, methods and results. At the present time we may say that we are coming forth from the period of construction and recognition into the broader and no less important one of system and science. This has not been accomplished without many misgivings as to results, and even the present attainments of dentistry are questioned by not a few. The logical mind must, however, admit one great truth, namely, that we have arrived at our present condition because of our own labor and inherent worth. We have borrowed many ideas and thoughts from other callings, and yet have founded a new one, which, in its broadest and best sense, is the equal of any in the alleviation of humanity's ills. Is not our use to humanity the only true guiding star for the future? In fact, will not the lasting history of dentistry depend on it? If we admit these truths we have a path of progress which is blazed in no uncertain manner—a progress which will bring forth the only lasting attention of the world—for the needs of humanity and science.

The foundation of education in our calling has been said to be our "preliminary education." An understanding of the word preliminary would indicate that it was something which leads up to the calling of dentistry, or which is, in other words, the primary part of dentistry. A logician would say it was the cellar on which was erected the main structure. Thoughtful men are questioning the worth of the present preliminary requirements to the college life; there is even a class of practitioners who question the methods of teaching in some of our colleges, and not a few do not believe in four terms. Four terms are frequently erroneously expressed as four years. These men are at least honest in their convictions. Let us reason a little. The various acceptable colleges are supposed at the present time to have as a requirement a minimum preliminary education equal to two years in high school. This is a very elastic

standard. Does any intelligent man think that all high schools give an equal training? If he does I will refer him to the latest report of the Commissioner of Education. There are high schools in this country where two years' work counts for no more than graduation from some first-class grammar school. There are students who will matriculate at some of these easy schools, and after passing their freshman year will matriculate at a good college requiring an honest preliminary standard. This latter school accepts them in the second year without a preliminary examination. Thus are the honest colleges cheated. Educators of first rank in other callings long ago dropped the certificate business and put each prospective student through an honest examination. Gentlemen, let us cease being hypocrites and come to the only safe preliminary requirement—examination. If we continue as in the past many of our schools will profit over honest ones to the detriment of dentistry. More could be written about the shortcomings of our educational system but time forbids. However, if any have doubts as to the truth of my statements, let them interview members of some of those state dental boards requiring a high grade written examination. An oral examination is not always a criterion for an ordinary knowledge of English, but a written one is frequently so.

Suppose in time we admit our preliminary requirements are not up to the proper standard, and we either require a diploma from the highest grade high school or give an examination equal to it, will that be for the best interests of our calling? Or suppose we go farther and require an A.M. or an A.B. degree. Will the possession of these degrees best conserve the future of dental education? There exists a grave doubt in my mind. Let us again do a little reasoning.

Previous to about 1820 it was a common belief that education was to be derived solely from the systems of the so-called schools and colleges, and unless a man followed literature, statesmanship, law or medicine he could not class himself as belonging to the educated people. Indeed, many did not class medicine as the equal of the others. Froebel, the educational reformer, was born in 1782, and in 1826 produced the great work entitled, "The Education of Man." He brought out many other writings along the lines of the kindergarten system; but this great work of 1826 brought about a revolution in educational work, especially in Germany, Great Britain and

the United States. He died in 1852, but not before he had seen his educational reform work an accepted truth. Spencer in 1861 produced his work on "Education" and paved the way for a rational education. La Conte, Tyndall, Quick, Haeckel, Painter, Bain and many others have followed along similar lines. The time is now passed when the training of the mind alone constitutes education in its best form. To be sure, there are people in the so-called higher (?) society of the world who consider the use of the hands in life work as not only a low form of education but also as ungentlemanly. The older days of dentistry produced a practitioner second to none in technical ability. And why? Many started young to learn mechanics of some kind and drifted into dentistry, while others served a long apprenticeship under a good instructor. In the words of Dr. C. T. Stockwell of Springfield, Mass., "The laboratory was his throne and his college; and here he toiled faithfully and well, and wrought out the very foundation of the superstructure which we pride ourselves in calling modern dentistry."

Those old days are gone never to return, and I am optimistic enough to believe it is for the best. But is there no underlying fundamental to grasp from their past experience in dental education? Is it not this, that we must gain our technical or mechanical dexterity before entering college? If we are to produce scientific practitioners we must at the present time take up manual training in conjunction with selected studies. The United States to-day stands second to Germany in manual training ideas and facilities, and the time seems ripe for dentistry to start a course in the various public schools suitable for the higher development of the mind and hand along the lines of preliminary dental education. We have people who are color-blind and tone-deaf, and may we not safely say many are and always will be mechanically or technically "dense?" Where is the better place to discover this? Is it not in the preliminary school rather than in the college? In fact, is not the greatest need of our present educational system of dentistry some reasonable way of "dropping" these technically imperfect students?

We hear many decry the setting up of a system of dental education apart from the medical men, claiming that dentistry is a specialty of medicine, and that our calling will never be what it should be until we have the title of M.D. Has medicine such a mort-

gage on the knowledge essential to our advancement that we will have to go to her to obtain it? Perhaps it is the degree and not the knowledge that is needed for our advancement. To those who think this degree is essential all respect is due, but they seem to forget that this is the age of all knowledge to the end of the best dental training. We need no extra degrees, but we do need any knowledge that will lead to higher and better dentistry. The future will surely evolve the fact that when we enter a dental college it is for a specific course, and that many of the studies we now take up in college will have been mastered in our preliminary colleges—the public common and high schools of technical training. As yet we are but on the border line of technical education, and the future will surely surprise us.

The literature pertaining to dental education has of late brought forth valuable and pointed thoughts from men teaching dentistry in our colleges, and it is easy to discern that the material furnished them is not entirely satisfactory, and that the future welfare of our calling will surely demand a change in the present so-called preliminary requirements. Have we not worshipped long enough at the altar of the "false god" of the "other fellow?" Is not the time at hand for a change?

Discussion. *Dr. G. V. I. Brown,* Milwaukee: I would correct an impression given by this paper concerning the preliminary requirements of the National Association of Dental Faculties with regard to students, which is not in accord with the present state of affairs, because such preliminary examination is now in the hands of the state superintendent or the highest authority in education in the particular state in which the college happens to be situated, and it is not in the somewhat lax condition that the paper represents it to be.

Dr. E. A. Bryant, Washington: To a great degree I concur in the ideas expounded by the essayist. The main thought of this valuable paper may be said to center in manual training as a preliminary to the study of dentistry, and to that feature I subscribe, providing the present "medico-dental" methods of teaching are to be relegated to the rear. Let me read an extract from a letter of Dr. Kirk's which was read at the last congress—"To my great surprise I have observed that the number of those who fail in their yearly examinations has increased in proportion to the increase in the entrance ex-

have one patient who will not keep his teeth clean and you cannot see the bridge therein for the filth.

Dr. F. B. Noyes, Chicago: The human mind has a tendency to swing from one extreme to another, and we are apt to think that a single new fact disproves everything previous. On the contrary, in the scientific world there are few revolutions and there is a continuity in the development of thought. Each fact discovered takes its harmonious place with what has preceded it. Heterogenesis as a biological fact was disproven long ago. There is nothing more fundamental in biology to-day than the universal law of heredity, namely, that all living things are derived from similar living parents. A correlative with this fact is the law of variation—that no living thing exactly resembles either of its parents. Up to the last decade the study of bacteriology was concerned with the identification of species and their relation to certain diseases, which latter has been proven. In the future we shall not overthrow those beliefs, but will study the modification of the species by its environment. Bacteria resemble other organized things in that their environment affects their functions. Biologists to-day recognize that all the phenomena of life presented through the cellular organization are but exalted chemical reactions, and that these reactions are dependent upon the reagents present. By changing the food of a poisonous snake its secretions may cease to be venomous, but give it again its proper food—restore its natural environment—and its bite will be as poisonous as ever. The same thought applies in bacteriology. Certain germs produce given diseases under certain conditions, but not under others, but it cannot be proven that tetanus bacilli can produce tuberculosis. The same disease may be produced by different germs, and the same germs may under varying conditions produce what are recognized as two diseases, for instance, croup and diphtheria, pulmonary pneumonia and pericarditis, but that does not annihilate the identity of species nor establish heterogenesis in biology.

Dr. N. S. Hoff, Ann Arbor, Mich.: In substance the essayist stated that a man who has habitually followed one line of work, such as operative dentistry, is thereby disqualified to mutilate the teeth for the proper adaptation of bridgework. Some have further stated that not only are artistic ideals to be wholly set aside in making

crowns and bridges, but also many of the physiological principles upon which they should be constructed are to be subordinated to mechanical rules. It seems to me that the artistic aspect of this subject should be given its due proportion of consideration. I cannot bring myself to mutilate or destroy tooth structure for the purpose of making some particular form of bridgework. I believe in bridgework and think it should be made as substantial as possible, but that is not the paramount issue at stake—rather the artistic restoration of the existing conditions. This attitude, as the essayist has indicated, may come from my training as an operator or as a conservator of the dental organs. This discussion has emphasized the fact, as stated by Dr. Black, that we must use judgment in all crown and bridgework, and has given us one of the strongest possible arguments for broader culture—a culture which will make every man who undertakes any operation in dentistry the possessor of a judgment which will enable him to at least approximate the best results. Such judgment cannot be obtained by adopting the ideas of any one man or by looking at the matter only from the mechanical, the physiological or the artistic aspect.

Dr. Black: For the last ten years there has been a great effort among bacteriologists to trace the changes presented by those forms of microorganisms which show variations in form or function, and it has been found that there are many germs which present some of the characteristics of insect life, appearing first in one, then in another, next in a third form, and then repeating the cycle. The work and the conclusions seem to have been taken by some to indicate that the forms of microorganisms are uncertain, but the conclusions reached up to the present time determine the fact that these germs, although changing in their character, are still as reasonably certain as are other forms of life.

Dr. A. J. Flanagan, Springfield, Mass.: The fundamental principle of bridgework is that we are dealing with live and not immovable objects. Men who can make a beautiful bridge on a dummy case cannot necessarily do as well in the mouth. As I understand it, the question reverts to the statement made three years ago by Dr. Hungerford, namely, that it is better to remove the pulp with the tooth in a normal condition than to defer the operation until it is forced upon us by abnormal conditions. This statement has never

been refuted. As regards crowns causing death of the pulp, these questions arise: First, is it caused by grinding down the tooth? Second, is it caused by the medium with which the crown is set? Third, is it caused by a pathological condition outside these mentioned? Before we can arrive at any conclusion as to the best method to be adopted in crown and bridgework we must ascertain definitely what causes death of the pulp.

Dr. Rhein: Dr. Bryant spoke about a form of removable bridgework which I devised. It was never my intention to introduce it as something which should become a system, but it was intended to take the place of the sort of bridgework that he mentioned, where the bridge could not be seen because of the filth covering it. The form of bridgework which I introduced has been used by a number of men, and from the principles then elucidated the Griswold system has been evolved. Proper judgment should be used in determining whether a fixed or removable bridge should be inserted. Dr. Bryant certainly condemned himself when stating that he put a fixed bridge in the mouth of a patient who would not keep it in a sanitary condition.

Dr. G. D. Sitherwood, Bloomington, Ill.: Bacteriologists tell us that certain germs are always present in the mouth, and that under given conditions they become pathological and do harm, so Dr. Hungerford has advocated this particular style of bridgework, not only for mechanical and other reasons, but so that no lodgment will be afforded for debris that will feed these germs and cause them to become pathological. Dr. Hungerford did not set forth a specific plan for making bridges, but he laid down universal principles that we should all recognize and work out in our own individual way.

Dr. Crouse: I consider the cause of failure in bridgework to be the loss of the peridental membrane. This is what makes bridges come out with the roots and all attached, and anything that will obviate this inflammation and loss of tissue should be looked into.

Dr. Bryant: In answer to Dr. Rhein, I have done something myself in the line of removable bridgework, and as regards the patient with a filthy mouth, the same trouble existed with a removable as with a permanent bridge, for he would not take out the removable bridge to clean it.

Dr. A. C. Hewett, Chicago: We can all earn a lesson by looking

Most writing can be traced back to him as authority, and these points are creating confusion in the profession and especially in the minds of students today. Tomes considered the enamel to be formed

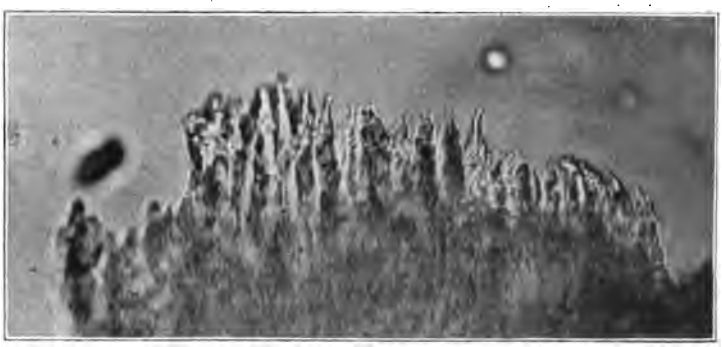

FIG. 1.

by the direct calcification of the ameloblast or enamel-forming cells, the deposit of calcium salts beginning in the periphery of the cells; consequently he stated that in the cleavage of enamel the rods split

FIG. 2.

at their centers, and in decalcification the substance of the rods was more easily soluble than the substance between the rods. These statements have been so completely disproven, and the reverse has been so perfectly demonstrated by Miller, Black and Williams, that

they should not be repeated in standard text-books today, but you will find these statements in the latest and best works on histology.

It needs no extended study of the tissue to satisfy oneself on this point. Miller, Black and Williams have shown that in caries of the enamel the acids produced dissolve the interprismatic substance, finally separating rod from rod. One need only examine enamel debris from a carious cavity to demonstrate the point, showing the ends of the rods projecting like the pickets of a fence (Fig. 1). The best demonstration, however, is obtained by grinding a thin section at right angles to the rods, and after polishing the surfaces

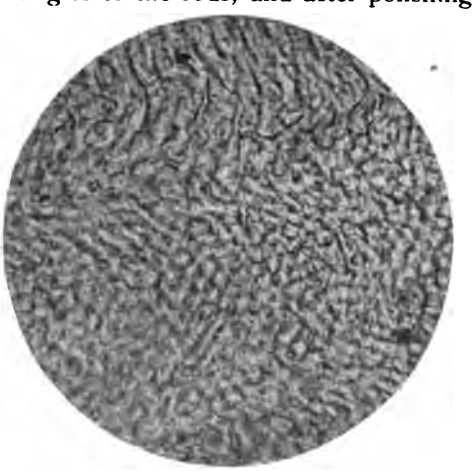

FIG. 3.

and studying the section under the microscope, remove the section, cover one side with vaselin and etch the other surface for thirty seconds with five per cent hydrochloric acid, and remount, etched side up. That the cementing substance is removed and the enamel prisms are left much more distinctly outlined will be most evident. I have attempted to show this in photographs, but they do not do justice to the sections because of the restriction of focus to one plane (Figs. 2 and 3).

The same text referred to above follows the German author in translation, with the statement that because of the greater area of the outer as compared with the inner surface of the enamel, the enamel prisms are greater in diameter at their outer than their inner extremities. I do not know upon what observations this state-

ment is based, but so far as my studies go it certainly has no foundation in fact. According to my observation, the difference in diameter of enamel prisms at the surface of the tooth and the surface of the dentin must be very slight indeed, and not at all sufficient to account for the greater area.

There seem to me to be two reasons for the scanty writing on the relation of enamel structure to cavity walls. The first is the complexity of the fibrous structure of the tissue in many places, and the second is the difficulty of showing from sections the relation

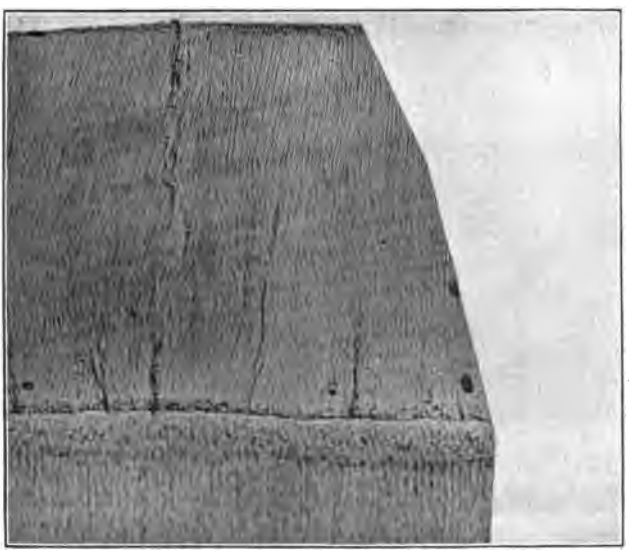

FIG. 4.

of rod-direction to the entire crown as we look at the tooth in operating.

I do not like the word fibre or fibrous structure as applied to the enamel, for it seems to me to have associated with it the idea of a soft or elastic substance, while the enamel is rather to be compared to a wall of solid masonry, composed of very slender, irregular prismatic columns fastened together by cement of almost the same density. The arrangement of these columns may be simply straight and parallel with each other, or they may be wound and twisted about each other in the most complicated form. Naturally the ar-

rangement of the structural element in this wall is of the greatest importance to one who would repair damages in it and build thereon a strong edifice. Naturally, too, where the enamel rods are straight and parallel the tissue breaks down easily before cutting instruments and the tooth may feel "soft," while the gnarled and twisted structure is as hard to cut as a pine knot, but the calcific composition of the two might be the same, and their resistance to the advancement of caries identical. In almost all positions, except sometimes over the point of the dentin cusp, the gnarled condition does not extend to the surface, but the outer parts of the rods are straight and parallel, so that the outer portion may cleave easily, leaving a layer of enamel next to the dentin which it is extremely hard to remove.

FIG. 5.

FIG. 6.

While the enamel is the hardest known organized tissue, it has little elasticity. In other words, if perfectly supported by the dentin beneath it will sustain great force and resist abrasion, but if its structural elements are not supported it will fracture easily on the lines of the cementing substance, here and there breaking across the rods, especially where they twist about each other.

Taking these characteristics of the tissue as sufficiently demonstrated, the structural requirements for strength of an enamel wall may be stated as follows: 1. The enamel must be supported upon sound dentin. 2. All of the prisms which enter into the formation of the wall must have their inner end supported by the dentin. 3. The prism which forms the cavo-surface angle must be supported by shorter prisms, which will be covered in by the falling material. 4. The cavo-surface angle must be so formed as not to

fracture the ends of the prism in condensing the filling material against them.

These conditions must be met in all positions in order to pro

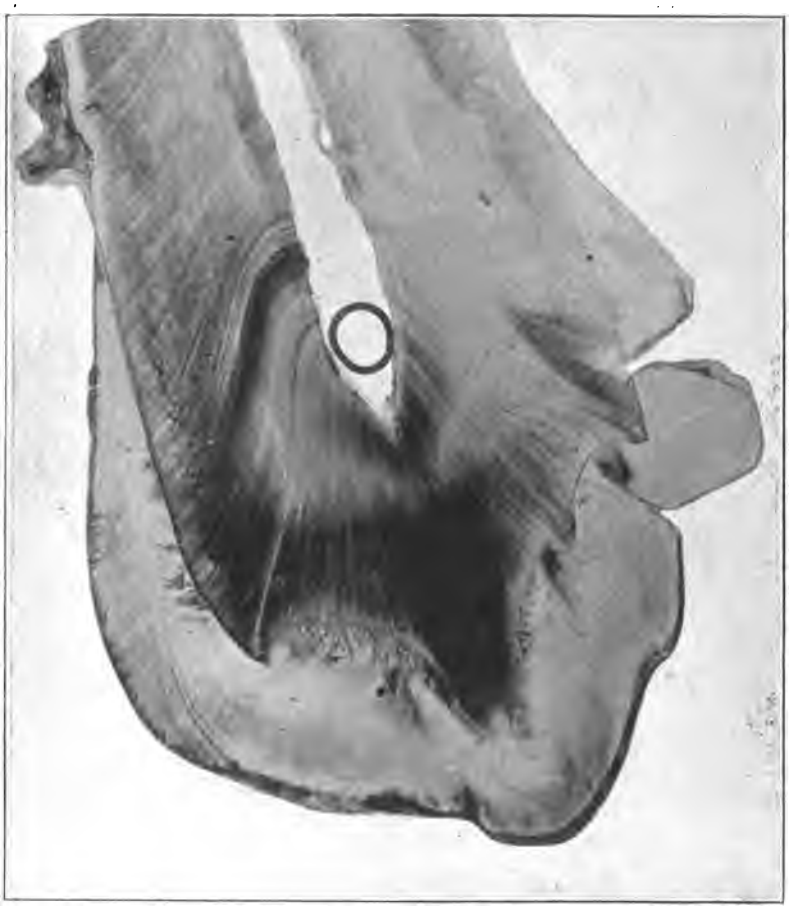

FIG. 7.

duce a wall against which gold can be condensed, or which will sustain continuously the forces to which it will be subjected afterwards. The filling material can never be made to support the enamel in the same sense as the dentin did, upon which it was formed, and it is

best that enamel walls be considered no stronger after filling than if left empty.

Fig. 4 shows the conditions which are fundamental in the

FIG. 8.

formation of strong enamel walls in all positions, though the means of producing the conditions must be modified in various parts of the tooth. The enamel which forms the wall is all supported by sound dentin, upon which the inner ends of the rods rest, and the rod

forming the cavo-surface angle is supported by a mass of enamel rods covered in by filling material.

From even a superficial examination of the arrangement of the enamel rods in the architecture of the tooth crown it is seen that, beginning at the gingival line, they are inclined apically from the horizontal plane, and passing occlusally they reach the horizontal plane at a little below the middle of the axial surface on bicuspids and molars, and about the junction of middle and gingival thirds on incisors and cuspids, so at that point they are at right angles to

FIG. 9.

FIG. 10.

the axis of the tooth. Passing occlusally from here, they incline more and more occlusally until at some point over the point of the cusp or occlusal edge they reach the axial plane, but here they are often very much twisted and contain many short rods. Passing over this point down the central incline, they are inclined away from the axial and toward the grooves or pits, the degree of inclination depending largely upon the height and inclination of the cusps.

This arrangement gives us cavities with two classes of enamel walls—1. Cavities where the enamel prisms are inclined toward the cavity, characteristic of occlusal surfaces, molars and bicuspids, and lingual pits of incisors and cuspids. 2. Cavities where the enamel prisms are inclined away from the cavity, characteristic of axial surface cavities.

It need hardly be said that in the first it is usually easy to

provide a strong wall, while in the second it is always difficult. Fortunately, however, the latter are not subjected to stress after [illegible] but the wall must be strong enough to sustain

FIG. 11.

the condensation of gold against it, which it will not do unless constructed in accordance with the structural requirements described.

Before going any further it is necessary to say something of

how these principles are to be studied and followed out in practice. First, it is very essential to have some knowledge of enamel structure and rod-direction, obtained best, of course, by the study of ground sections under the microscope. Next in value to direct observation is the study of photographic prints, which allow the use of a reading-glass to bring out detail, but unfortunately half-tone reproductions will not allow of this because of the screen used in etching. After this basis of interpretation is gained, knowledge of enamel-rod direction is to be constantly studied by the feeling and action of the tissue under hand-cutting instruments, interpreting observations in terms of microscopic structure.

FIG. 12.

FIG. 13.

In preparing an enamel wall the first opening may be made with a bur, and the cavity may be extended more or less in the same way, but then if you are to know anything of the structure of the wall which you form, the direction of the rods must be determined by cleaving with a hand instrument. A chisel or hatchet is applied to the surface and force is applied in the direction the enamel prisms should run—a piece splits out and you may find that the direction is not quite what you thought it would be. This cleavage represents fairly accurately the rod-direction, but it may have broken across a few rods, so the enamel wall should be smoothed by a planing motion of a sharp chisel or hatchet, so as to extend the inclination of the wall slightly. Then the cavo-surface angle may or may not be beveled as the position demands and the amount of inclination of the wall indicates.

In the development of the tooth the formation of enamel begins

FIG. 14.

slightly precedes the enamel and proceeds from without inward, the enamel from within outward. After the calcification has begun at these centers, which are at first close together, the growth of the tooth germ moves them farther and farther apart, until the full

size of the dentin surface is reached and calcifications from the separate centres unite, after which there is no further increase in size save by the growth of enamel on the surface.

The enamel first formed at these centers seems to be often imperfect, and the rod-directions are usually very irregular and twisted

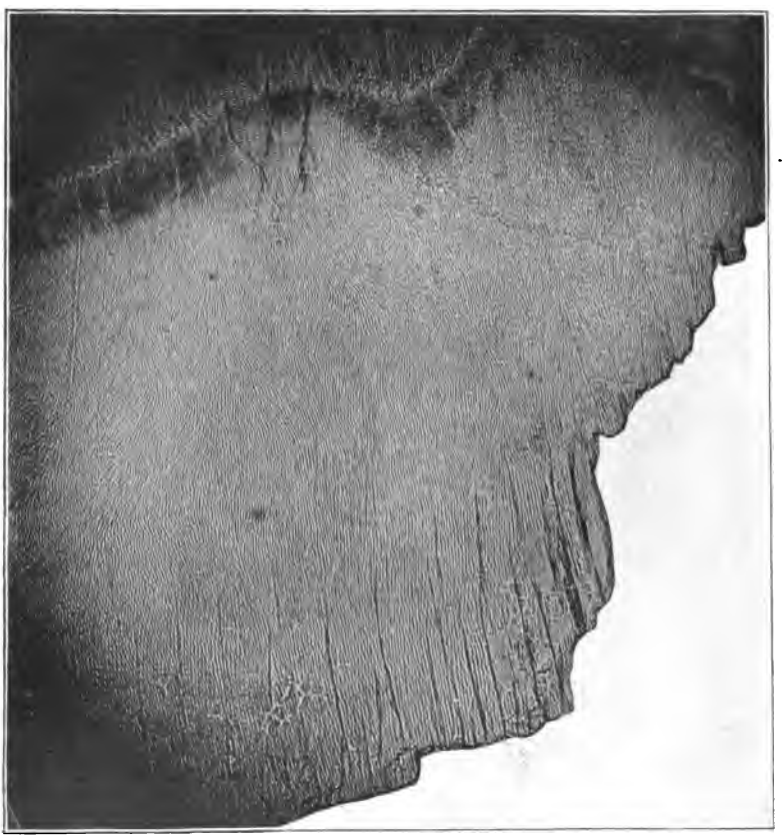

FIG. 15.

about each other; also the point at which the tooth surface is first completed is not at the tip of the enamel cusp, but at the point directly over the tip of the dentin cusp, which is slightly axially from the tip of the enamel cusps. This area is a position of weakness for enamel margins.

FIG. 16.

We may take a series of bucco-lingual sections of bicuspids and molars to show these things, as the record is left in the formed tissue. The brown lines sweeping around the cusps obliquely

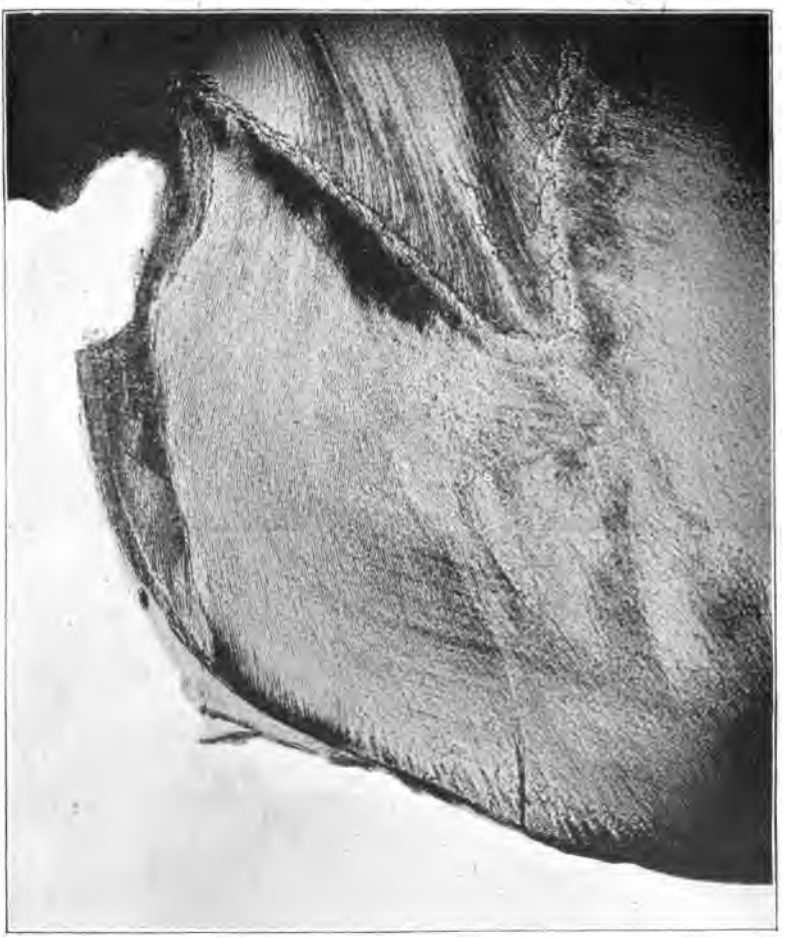

FIG. 17.

through the enamel, the bands of Retzius, stratification bands or incemental lines, indicate the portions of the enamel, which were in process of calcification at the same time. At first the two centers were close together, but they were carried farther and farther apart

as the development of enamel was carried farther and farther down the dentin cusp. Finally the calcification from the two centers united at the point which is directly under the surface groove and proceeded outward, but the tall column cells projecting from the forming surface more and more interfered with the nutrition of the ones at the point of union. Here the formation was first slowed, then stopped, and a fissure was produced. The dip of the bands of Retzius at these grooves is a record of this retarding of development.

While the defects of structure which produce lines of weakness in the enamel are easily observed on the occlusal surfaces of bi-

FIG. 18.

FIG. 19.

cuspids and molars, they must be recognized upon the axial surface as well and must be looked for in all the teeth.

The surface markings indicate the lines of union of the portions calcifying from various centers, and these lines are lines of weakness, and whenever a cavity wall approaches them closely it must be carried beyond them, cutting them out. Even where the surface is perfect the disturbance in the arrangement of the enamel rods may be shown in sections.

The tips of cusps and summits of marginal ridges are positions of strength and areas of immunity in the perfect structure, but they become positions of weakness when the continuity of the tissue is broken or a cavity margin is made to approach them too closely. Bucco-lingual sections of bicuspids and molars will show the general conditions.

Having studied the general arrangement of the enamel prisms in relation to the structural requirements for strength, and noted the imperfections of a structure as affecting the position of cavity

FIG. 20.

margins, it remains to study each tooth much more carefully by cutting sections in the positions of cavity margins and examining the structure as shown in the sections. In this I have not been able to do as much work as I had hoped, but I think there is enough to show that the continuance of the plans may bring knowledge of structure and manner of practice closer together.

The first tooth selected was a superior first bicuspid. With a diamond disk it was cut through from mesial to distal, as shown in Fig. 5, of the occlusal surface. Fig. 6 shows the mesial surface. The pieces were then cut off and ground, so as to leave the sections from the buccal and lingual pieces as close to the cut as possible. Unfortunately the central piece was lost after grinding. In Fig. 6

FIG. 21. FIG. 22.

a slight discolored spot will be seen at what was the contact point. Fig. 7 shows the buccal section. The enamel was so much affected, and the cementing substance so dissolved out from between the rods at the spot shown, that the tissue went to pieces in grinding, though the surface was unbroken when grinding was commenced, and the action on the dentin can be clearly seen. Notice the position of the oblique grooves and the enamel forming the mesial marginal ridge. If this cavity were prepared as a simple proximal cavity, the occlusal wall would require to be inclined occlusally about 10 centigrades from the horizontal; the gingival wall extended gingivally and inclined about 6 centigrades gingivally from the horizontal. The fallacy of such preparation is well illustrated in Fig. 8, showing the structure of the marginal ridge over to the oblique groove. The cavity wall reaches the area where the rods are becoming very much inclined occlusally, passing over the marginal ridge, and that portion of enamel is practically unsupported and will break out from the

FIG. 23.

force coming on it from occlusion, and that is the way it acts in practice.

A second bicuspid was cut in the same way. The occlusal sur-

FIG. 24.

face was very perfect. Figs. 9 and 10 show the position of the cuts from the occlusal and the mesial. In these grindings there is little of special interest except the perfection of structure in the oblique

grooves, and the extent to which the apparently slight decay has affected the tissue at the contact points, as shown in Fig. 11, the cementing substance being so softened that the tissue has broken out in grinding. Again, the lingual piece is too much across the rods to show them well. I wish to call attention again, however, to the similarity of structure over marginal ridges and the tips of cusps, as shown in the earlier bucco-lingual sections.

A third bicuspid was cut, attempting to bring the sections in the line of large compound mesio or disto-occlusal cavities. The tooth as sawed is shown in Fig. 12 from the occlusal, and in Fig. 13 from the proximal. The buccal and lingual pieces were ground so as to show the buccal and lingual walls of a disto-occlusal cavity,

FIG. 25.

and the mesial and distal pieces were ground so as to show the lingual sides. Notice the appearance of the mesial pit as it will be shown in the section. Of these only the lingual wall of the disto-occlusal cavity, and the section from the mesial piece, which shows the mesial pit, are reproduced.

Fig. 14 shows the lingual wall, and may be passed, stopping only to call attention to the outer straight and inner twisted arrangement of the rods on the occlusal as shown in higher power (Fig. 15).

The mesio-lingual piece (Fig. 16) shows the decay in the pit and the structure of the mesial marginal ridge, and Fig. 17, a higher power, shows the rod-directions better. This is a splendid illustration of what may occur when margins approach a marginal ridge. Notice the direction of the rods as the tip of the dentin ridge is approached. In that position it would be impossible not to have unsupported rods which would be sure to loosen sooner or

later, and if that point is reached the margin must be carried to where the structure can be trusted.

The next tooth worked on was a lower third molar of very perfect form, which is interesting chiefly as showing the extent of defect around apparently very good occlusal grooves, and the direction of rods on a very flat occlusal surface. Fig. 18 shows the occlusal surface and Fig. 19 the same after cutting. Numbering from the mesial, sections 1 and 2 were lost, but 3, 4 and 5 were mounted. Fig. 20 is from No. 3.

The upper first molar was selected as the next tooth, cutting so as to show the structure of the disto-lingual cusp and the enamel

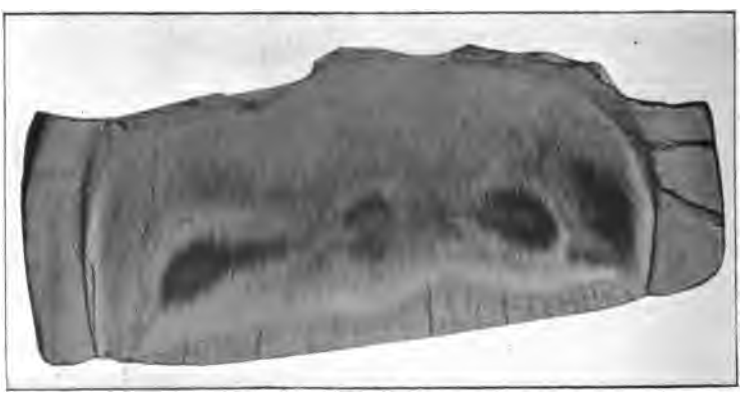

FIG. 26.

around the disto-lingual groove. Fig. 21 shows a typical first molar with fairly well closed developmental lines. Fig. 22 shows the direction of the cuts. From this tooth sections 1 and 2, numbering from the lingual, were lost; sections 3, 4 and 5 were mounted, but section 5 was of little value. Fig. 23 shows the cut through the crown in the position of section 3. There is shown the disintegration of the enamel in the region of the mesial pit, and the arrangement of the rods over the disto-lingual cusp, which is a position of weakness, especially when caries of the disto-lingual groove is complicated by caries on the distal surface. In many such cases the only way a strong wall can be made is by removing the cusp and cutting from the point of the dentin cusp in the horizontal plane.

Another upper molar of less typical form was cut in the same

way. One of the sections showed the complicated condition of a rough occlusal surface, and especially the rod-direction over the distal marginal ridge. Notice the inclination distally from the bucco-linguo-axial plane as the ridge, which is very flat, is approached. This is seen in the higher power of the ridge (Fig. 24), which also shows the twisting of the rods over the dentin tip.

FIG. 27.

The central incisor was the last tooth to be worked on, and here the only regions to which attention is called are the mesial and distal marginal ridges. Often proximal cavities extend far to the lingual, and we are tempted to leave a margin on the summit of the ridge. This is a point of weakness, to be compared to the tip of a cusp or the marginal ridges in bicuspids and molars.

An incisor was cut in a similar way (Fig. 25), from which sec-

tions 1, 2 and 3, numbering from the incisal, were mounted. No. 4 was broken. Fig. 26 is from the first section and shows the enamel worn off the marginal ridges near the occlusal edge. It is noticeable

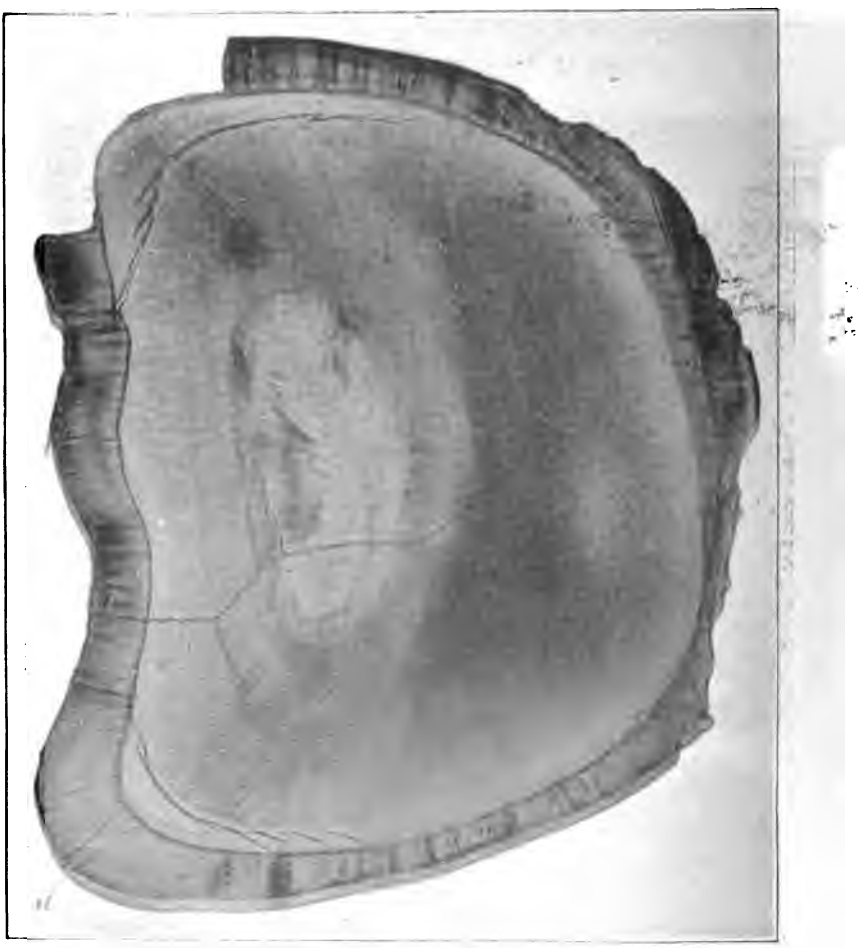

FIG. 28.

that wherever enamel is removed by abrasion the wall is left, fulfilling the requirements given for strong enamel walls. Next the dentin are short rods whose ends abut on the abraded surface, growing longer to the enamel surface. This is better shown in Fig. 27,

a higher power of the corner, and in worn incisor tips. When decay occurs on these worn surfaces some of the short rods are broken out and decay begins at the dento-enamel junction. Fig. 28, from the second piece, cuts well through the marginal ridges in the middle of the crown, almost if not quite in the direction of the rods, and shows the enamel over the distal ridge broken away, but the mesial

FIG. 29.

ridge perfect. Suppose a mesial cavity whose margin is approaching this region, if it reaches the point (a) it must be cut well over onto the lingual, or the enamel will be broken out by the force of occlusion from the lingual, if it is not fractured in packing gold against it in making the filling. Fig. 29 shows the structure in the limited area more perfectly.

MAXILLARY FRACTURES.

SPECIAL ESSAY BY ROBT. T. OLIVER, REPRESENTATIVE OF ARMY DENTAL EXAMINING BOARD.

The subject of maxillary fractures is one fraught with considerable interest, both to the general practitioner of medicine and surgery, and to the specialist of oral or dental surgery. To many of the former these cases are highly undesirable on account of the extreme difficulty of management, coupled with the uncertainty of accomplishing perfect results. To the oral surgeon, who perhaps is better able to cope with the peculiar characteristics of these cases, on account of his intimate knowledge of and familiarity with the parts involved, and his accustomed dexterity with the instruments, appliances and materials necessary in intra-oral operations, the average of perfect results is much greater.

The primary requisites for this class of fractures are essentially the same as for any of the "Osseous solutions of continuity" of long bones, namely, Reduction, Fixation and Immobilization.

In passing, it may be of interest to know that while these factors in the treatment of maxillary fractures were undoubtedly known and recognized long before the days of Esculapius and his associates, it was not until centuries afterward that the famous Ambroise Pare, successively known as the "Barber Dentist," "Army Surgeon," "Surgeon to the King and Surgeon General of the French Armies," in 1569 promulgated theories and developed practical methods for the accomplishment of these points which are sufficient proof that his ideas were advanced far beyond his era. His method of wiring the fragments in position, and then wiring the upper and lower teeth together, so as to tightly close the jaws with teeth in original occlusion, for the prevention of deformity and the reestablishment of the plane of articulation, is worthy of emulation at this late date.

Fractures of the inferior maxillary bone are the most common form of all maxillary fractures, and it is to this class of cases that I invite your attention. Statistics show us that this bone is fractured more often than any other bone of the face. By reason of its size, shape and location it seems to invariably receive the majority of blows and the heaviest force of impact, and in over 95 per cent of cases it is fractured by external violence. Men are ten times more liable to fractures of this bone than women, owing to their more hazardous occupations, with increased exposure to violence.

Fractures of the inferior maxilla may be classified into simple, multiple, compound and comminuted, and may be of a perpendicular, horizontal, oblique or transverse variety; occurring through the symphysis, body, ramus, coronoid, condyloid or alveolar process. The great majority of fractures caused by violent impact of force upon either the chin or side of jaw occur usually through or near the socket of the long cuspid tooth or the mental foramen, as these localities are ordinarily the weakest points of the body of the bone.

Symptoms.—The five cardinal symptoms in the diagnosis of fracture of the inferior maxilla are: 1. Pain. 2. Deformity. 3. Crepitus. 4. Impaired function. 5. Faulty articulation of teeth. These are accompanied by some or all of the following accessories of diagnostic value: 1. History of patient having received a blow, kick or fall upon that side of the face or head. 2. Patient's inclination to hold jaw up with his hands in his efforts to speak or swallow. 3. Patient's acknowledgment, when attention is directed to it, of a peculiar numbing pain through half of lower lip and angle of mouth, indicating paralysis of mental branches of inferior dental nerve, produced by pressure upon or tearing of nerve trunk by fragments of bone. 4. Profuse salivary secretion.

The popular treatment of these fractures by the medical fraternity in the past has been: First, reduction (or I prefer the term "adjustment") of fragments; and, second, the molding of pasteboard, leather, gutta-percha, or other form of mental splint, with side pieces extending backward along the body of bone; this external splint being held in position, with jaws firmly closed, by some form of occipito-mental bandage. This method in general has no doubt many advocates to-day who point with pride to the successful results obtained by it, but who is there to pass judgment upon the completeness of those results, and how many of the patients would present

deformity and impaired function, with impossibility of perfect mastication, due to the false planes of articulation?

While this method is to be highly commended for the good it has done in the past, its era of usefulness is rapidly passing, and we have arrived at a time when intra-oral counter pressure is regarded as a necessary adjunct to combat such possibilities as deformity, impaired function and false planes of articulation. A time when the specialties of medicine have asserted themselves, when competent dental surgeons or specialists in oral surgery should either be called for consultation in these cases or should have the full control of them.

Permanent Interdental Splints.—The various forms of interdental splints or modifications of them, whether wire, metal, vulcanite or celluloid, are constructed to fit over the teeth, to preserve the exact contour of the arch, plane of articulation, and to exert a counter pressure to external bandages. They are indicated in all fractures of the inferior maxilla, except those unusual ones occurring through the coronoid, condyloid or ascending ramus, and should be used in conjunction with and accessory to firm bandaging. Then the possibility of producing perfect results, such as firm union of bone, restoration of contour, reestablishment of articulating plane, with consequent restoration of masticating surfaces, is assured.

The main objections to the ordinary form of interdental splints are: First, difficulty in obtaining accurate impressions of the teeth, accompanied by the production of considerable pain to the patient; second, the length of time that must necessarily elapse before the appliance can be manufactured and be ready for insertion, for it must be remembered that if made of metal by any of the various processes of swaging and soldering, or even of vulcanite rubber, which perhaps is the simplest form, several hours have elapsed, during which the patient has suffered, not only from the pain of the primary "solution of continuity," but from malposition of the parts, due either to contraction of the muscles or the action of gravitation, operating upon a point of non-resistance. Usually he also suffers from mental distress over the anticipation of dreadful things yet to happen when the appliance is inserted.

The permanent interdental splint, however, has supplied a long-felt want, and has met the perplexities in the treatment of maxillary fractures in a splendid manner, for which all honor is due to those men of the dental profession whose ingenious minds and skilled

fingers have met the emergencies so squarely. These appliances are truly indicated in many cases to-day, especially in those which are presented many days after the occurrence of the fracture, for by this method a marked deformity, either of the bone contour or articulating plane, that has become semi-solid by reason of a thick callous surrounding it, can be beautifully remedied in the following manner:

Take impressions of the teeth regardless of deformity, and make casts of each jaw. Saw through lower cast along line of fracture, consequently through line of deformity, separate segments of cast containing the teeth out of alignment, replace this segment in relation to rest of cast, so as to restore contour of arch and plane of articulation, and hold in place (temporarily by wax) until the position is verified by occluding with cast of upper teeth. The small facets on the teeth, produced by long masticatory action, act as guides in replacing teeth on the segment in the original position. Now carefully remove wax and firmly fasten segment in correct position with cement; then proceed in the usual manner, waxing up, flasking, packing, vulcanizing and polishing. When ready for insertion the false position of the fragments of bone can be broken up by the proper direction and application of force, with the patient anesthetised if necessary. The parts can then be molded into new position, the teeth made to fit into their several receptacles in splint, upper teeth allowed to close into their receptacles, and jaws held in that position with an occipito-mental bandage. A Gunning splint or modification thereof is best indicated for the purpose.

One of the best forms of permanent interdental splints, for use in simple fractures occurring anterior to the ramus, is the Kingsley or some modification of it, which fulfils all the requirements of a splint, in holding parts in correct position, preserving perfect immobility, and giving the proper intra-oral counter pressure. At the same time it permits the patient to enjoy more latitude in the selection of diet, as he is able to masticate the softer foods, and it also gives greater freedom in the exercise of his face and jaw muscles, which are inclined to become stiff and painful when tied up for three or four weeks, as with a Gunning splint. It also permits of better facilities in the way of cleanliness and prophylaxis.

Writer's Method.—With a full realization of the importance of the following five cardinal points in the treatment of fractured jaws—1. Adjustment. 2. Fixation. 3. Immobilization. 4. Aseptic pro-

phylaxis. 5. Rest and nourishment—the writer begs to present the following method, to which he lays the claim of originality, and with which he has met with marked success in a large number of cases: After the usual examination of jaw and determination of the line of fracture, ascertain the exact condition of the teeth immediately adjacent to the line of fracture, paying special attention to two things—that the crowns are not broken or roots split, and that they are firm and solid in their sockets. Then begin moulding the parts into position, restoring contour, plane of articulation, and bringing the broken ends of the fragments into direct apposition and perfect adjustment. An assistant must now hold the jaw, mouth open, preserving the alignment, adjustment and contour of the reset bone, which can best be accomplished by assistant standing behind patient (if in an upright position) grasping from below each angle of the jaw in such manner as to allow the third and fourth fingers to support from below, and clutch firmly from within outward on the posterior fragment, allowing the second finger to do likewise with the anterior fragment, while the thumb and forefinger holding from the outside likewise support and retain the apposition and alignment, as in the manner of a long splint. If the patient is anesthetized and in a recumbent position, then the assistant must stand at head of table, taking same grasp as nearly as possible, remembering in either event that continuation of undisturbed adjustment is of the greatest importance.

Suppose, for example, the line of fracture exists between the first and second molars, and for the sake of expediency, imagine the adjacent teeth to be unbroken, firm and solid. I manipulate the jagged ends into perfect apposition, and restore alignment of bone and teeth, reproducing normal contour and normal plane of articulation. I now take a piece of 18-gauge, pure silver wire, about six inches long—preferably a Fleurs bone suture—sharpen each end, bend it at right angles about two inches from one end, and carefully insert the short end from without inward through the interproximal space between the second and third molars. If the third is not in position, form a loop around second molar, pulling the short end round to the angle of wire, bringing the long end close up, and touching the buccal surface of all the teeth on that side, with end projecting anteriorly beyond the incisors. By carefully shaping the short end, that now extends well into the mouth, I make it into a

staple, insert point from within outward, between first and second molars, and draw taut, so that it conforms to contour of lingual and both proximal surfaces, or if necessary it can be burnished to place. The short end is now twisted to shank of long end, by about two good turns with a long-beaked, flat-nose plier, at the mesio-buccal angle, forming a snug-fitting loop which firmly grasps the tooth at or perhaps just below the gum line. The long end is now pulled forward, inserted from without inward, into interproximal space between second bicuspid and first molar, pulled taut, burnished to conform to buccal and mesial surface, grasped again from inside, pulled backward, inserted from within outward between first and second molars, pulled taut, burnished to lingual and distal surfaces, and twisted with the half-inch stub of short end in such manner as to bring retained traction directly through broken ends of bone, along the line of its axis, with such firm, steady force that the bone maintains its original alignment and contour, presenting a normal appearance. If greater strength is required, take in two teeth on either side of fracture by a figure 8 weave with the same method of twisting ends for traction. The jaws are now carefully closed and firmly held in that position by the assistant until commencement of next step.

If it were not for the loosening effects of consequent inflammation, the liability of unequal pressure due to muscular contraction, or the patient's probable bungling efforts in eating, this adjustment might be all that is necessary for completion of cure, but it is advisable not to stop here, but to proceed in obtaining more complete fixation of parts beyond the possibility of disarrangement, utilizing this wiring process as a primary factor, useful only in temporarily holding the acquired adjustment, after the digital manipulation has secured a restoration of alignment, contour, apposition and plane of articulation.

I next take gutta-percha or modeling compound, rendered plastic by hot water, select a piece about 1½ inches long and ⅝ inch thick, into which I incorporate a small section of hard wood ½ inch long and ¼ inch in diameter, placed about ¾ inch from one end. Then introduce the plastic into mouth (which is wide open) the wood end first, carefully placing it between upper and lower teeth, then allow teeth to close into it, moulding the plastic with fingers and in-

struments outside, and with little finger inserted between incisors contouring it concavely inside, giving greatest amount of space for tongue. By application of cold water or cloths the material is chilled and becomes hard, firm and inelastic, making an excellent interdental splint which will absolutely hold the parts to their adjustment. This splint is now carefully removed (assistant holding jaw from behind), trimmed up, presenting smooth, round, thick edges, to avoid crumbling, and reinserted, the teeth fitting into their original positions.

The wood is used for two reasons: First, to act as a "stop," preventing complete closure of teeth through plastic compound, which would interfere with the feeding of patient and hygienic cleanliness; and, second, to act as a fulcrum over which leverage is constantly exerted by contraction of the anterior fibers of the masseter muscle, assisted by the counter external pressure of bandage, which overcomes the possible contractive drag of the digastric muscle, and force of gravitation, and supports the long, heavy, drooping anterior fragment, keeping it tightly sprung up into position, while at the same time the posterior fragment, which invariably tends to draw up and out of alignment, on account of contraction of the temporal, masseter and internal pterygoid muscles, is firmly held down and prevented from shifting its position by coming in contact with this resistance. I regard this second reason as a most important factor in using plastic interdental splints, for by its use in the proper position (always on the posterior fragment) we are enabled to feel an assurance that this fragment will remain in the corrected position. By this method we can successfully treat fractures by an interdental splint, with all the advantages of absolute fixation, opportunities of feeding, possibilities of hygienic cleanliness, and tolerable comfort to patient, without the worry, care, labor and consumption of time necessary to take impressions, construct models, wax up, flask, vulcanize and fit a permanent splint, not to mention the pain and discomfort of patient in so doing.

The jaws are held in position by application of an occipito-mental bandage, preferably of plaster paris, either of Barton or figure 8 variety, using a five-inch square of rubber dam or oiled silk in position as a protection or bib, covering that portion of bandage lying below the lower lip. This is placed in position by laying it flat over

the face before the bandaging is commenced, the lower border even with the chin, allowing the various layers of the bandage to cover it. Afterwards it is turned down over that portion of the bandage below the lower lip and protects it from becoming foul by absorbing saliva, medicine or food, and is easily kept clean and sweet by frequent sponging with an antiseptic solution.

MINUTES OF THE SIXTH ANNUAL MEETING

OF

THE NATIONAL DENTAL ASSOCIATION,

HELD AT

Niagara Falls, N. Y., July 28-31, 1902.

FIRST DAY—MORNING SESSION.

THE morning session was called to order at 11 o'clock by the President, Dr. J. A. Libbey.

Prayer was offered by Dr. J. Taft.

Dr. L. G. Noel, Vice-President for the South, was called to the Chair, when Dr. Libbey read his annual address.

On motion, the address was referred to a committee of three, to report to the Executive Council on the recommendations therein contained. The Chair appointed Drs. G. V. I. Brown, Wilbur F. Litch and C. N. Johnson as members of that committee.

Dr. J. N. Crouse asked the privilege of the floor for Dr. E. T. Darby, who, on behalf of the Pennsylvania State Dental Society, presented a gold-mounted ivory gavel to the President. Dr. Libbey responded, thanking Dr. Darby and the Society for the gift.

Dr. H. J. Burkhart, Chairman of the Executive Council, then presented the report of the Council on program.

On motion, the report was adopted.

Dr. Burkhart then read the following resolutions, which were submitted to the Executive Council, relative to the holding of the Fourth International Dental Congress in St. Louis, in August, 1904:

No. 1.—WHEREAS, In 1904 there will be held an International Exposition in St. Louis, Mo., U. S. A., to be known as the Louisiana Purchase Exposition, in connection with which provision has been made for the holding of a series of International Congresses, some of which are already organized; and,

WHEREAS, The dental profession in America have been requested to or-

ganize in connection therewith a congress which shall adequately represent the interests and attainments of dentistry; therefore, be it

Resolved, That the National Dental Association of the United States of America hereby invites the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Congress, to designate St. Louis, Mo., U. S. A., as the place, and the month of August, 1904, as the time, for holding said International Congress.

No. 2.—WHEREAS, The National Dental Association has adopted a resolution inviting the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Dental Congress, to designate St. Louis as the place, and August, 1904, as the time, for holding said Congress;

Resolved, That three Commissioners be appointed by the President of this Association to convey to the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Dental Congress, the cordial invitation of the dental profession of America, through its National Association, to unite in the holding of a Congress, to be called the Fourth International Dental Congress, at the time and place stated.

On motion, the resolutions were adopted.

Dr. Thomas Fillebrown, Chairman of Section V, then presented his report.

Report of Chairman of Section V.

The discoveries during the past year in the branches of Anatomy, Pathology and Surgery do not bring marked addition to our knowledge, but the discussions upon these subjects show a decided advance toward a better understanding of many problems, and give promise of determining satisfactorily in the not distant future many of the points that have long baffled explanation. It will be impossible in the space and time which I can be permitted to occupy to give anything but the merest outline of only a part of the work upon these subjects.

The only definitely new discovery is of an additional bone in the foot, by Professor Thomas Dwight, which he has found in a sufficient number of cases to entitle it, he thinks, to a permanent place in the list of normal bones of the foot.

Dr. David Riesman and Dr. A. O. J. Kelley have contributed a valuable article on the relation of bacteriology and pathology. One of their interesting statements is that aseptic wounds are rarely sterile—of forty-three cases examined but eleven were found so.

Staphylococcus pyogenes albus was commonly the infecting agent. The greatest number were found on the second day of healing. They believe that "aseptic fever" is due to the absorption of organic materials and the products of bacterial metabolism from the wound.

They seem to credit the statement that carcinoma is increasing, and quote from the report of the Committee of the British Medical Association that the physical conditions where carcinoma prevails are contamination of the soil with sewage, and general lack of drainage. Evidence is adduced that there is a special tendency to the occurrence of malignant disease in certain houses and groups of houses, and on the whole carcinoma is reported to be more prevalent in old houses and districts than in new ones. (*Year Book of Medicine and Surgery.*)

Dr. James Ewing has made some valuable contributions to the pathological anatomy of malarial fever, showing the effect of the disease on the various organs of the body. No member escapes its baneful influence. His account of its destructive effect upon the marrow is interesting from a dental view. Cellular hyperplasia is pronounced, the nucleated red cells are abundant and lymphocytes are overabundant, while fat cells are atrophic. The blood shows anemia of the chlorotic type, with a marked tendency to develop the signs of pernicious anemia. The condition has, of course, a depressing effect upon the osseous support of the teeth and must be recognized as one efficient cause of the atrophy of the alveolar walls. (*Journal of Experimental Medicine.*)

Dr. A. Michel finds that the saliva has a great influence on caries of the teeth, and that the quality of the drinking water influences the composition of the saliva. He finds that the water of Wurzburg has fifty times as much calcium oxid as that of Lohr, and the calcium oxid of saliva taken from the inhabitants of Lohr is only one-sixth that found in the saliva of the inhabitants of Wurzburg. Dr. Michel came to the conclusion that where a lessening of caries is found there is an increase in the amount of sulphocyanic acid and an increase in the alkalinity of the saliva.

The second annual report of the Cancer Committee of the surgical department of the Harvard Medical School was presented in February, 1902. The Committee is making systematic efforts to fix definitely the cause of cancer. The great diversity of opinion in regard

to it makes the task a laborious one. These differences are emphasized by the fact that of eminent scientists twenty-seven believe in the contagiousness of the disease, eight believe that it is not contagious, sixteen believe that bodies found in cancer are degenerate epithelial cells, while eleven believe that these bodies are parasites. So we must wait a little while for a solution of the question.

Dr. Miller discusses the presence of bacterial plaques on the surface of the teeth. He denies that a film on the surface of a carious surface can be taken as evidence that the film gives rise to the caries. Three jaws which he examined did not show a trace of tooth caries, yet all revealed a normal extension of the film when stained with eosin, and the teeth of his colleague, who is immune to caries, presented as fine a growth of film as one could desire; only the cusps of the teeth being free. Other writers have conceived that caries was bound to follow the presence of a film, under which the bacteria were sure to be present and carry on their destructive process. Dr. Miller thinks that in some cases the film serves as a protection to the tooth instead of a menace. (*Cosmos*, May, 1902.)

W. Arbuthnot Lane offers some new ideas on the form of the alveolar arch. He maintains that besides the presence of the teeth there is an additional factor controlling the development of the upper jaw that does not influence the lower jaw to anything like the same extent when movement of these bones upon one another does not exist. Second, that in a normal skeleton the lower jaw is dependent for its perfect development upon that of the upper jaw. He thinks that respiration has also great influence upon the development of the jaws, and substantiates his position by photographs of children bred under conditions unfavorable to full respiration. (*Clinical Journal*, Vol. XVII.)

Phagedenic pericementitis comes in as usual for discussion during the past year. Dr. Wright has contributed an excellent article which throws considerable light on this much-discussed subject. (*Cosmos*, February, 1902.)

W. Booth Pearsall, F. R. C. S., in the *Journal of Anatomy and Physiology*, has proposed a new method of comparing the anatomical formation of the teeth by the use of diagrammatic outlines instead of drawings. He thinks his method produces more accurate results, and his arguments make the scheme more desirable.

A new method of administering electricity for local anesthesia has been suggested. M. Regnier, head of the laboratory of electrotherapy of the Charity Hospital, and M. Dydsbury of Paris describe it in *La Nature.* The operation is the placing of a simple conductor (using an arrangement of M. Gaiffe) in connection with an electrode to be applied to the region to be anesthetized. Thus far the experiments have mainly been tried in the operations of dentistry. An account submitted to the French Academy of Sciences says that in fourteen cases of extraction of monoradicular teeth thirteen cases of complete insensibility and one of relative insensibility were produced, the current in the one instance having been applied only thirty seconds. But although the method is so new, there are already indications that it will soon be applicable in the most severe operations of surgery. M. Billenkin, a surgeon at Epernay, reports that he has been able to use electricity in cases that up to this time have required the employment of chloroform. He mentions an operation which was performed without any pain to the patient, involving the removal of a large hemorrhoidal mass.

Dr. Joseph Head has contributed an article on a method of bleaching the enamel of teeth with living pulps. He isolates the tooth with rubber dam, applies pyrozone, and while the tooth is still wet applies an instrument as hot as the patient can readily bear. This, he contends, drives in the steam from the hot instrument and also liberates the nascent oxygen that is in the enamel. The true value of this can be determined only by repeated experiments. (*Items of Interest.*)

An interesting and perhaps the most important contribution of the past year is furnished by E. C. Kirk, on the Chemical and Clinical Study of Erosion. He states that he believes dental erosion is a constitutional disorder with a local manifestation, and that it presents two types. He also states that he has demonstrated the cause of one type of erosion to be lactic acid, and of the other type to be exudation of acid sodium phosphate. The first type is due to fermentative processes in the mouth, and the second to a disordered condition of certain buccal mucous glands. The article is worthy of not only a reading but of careful study. (*Items of Interest.*)

On motion, the report was accepted.

Dr. D. R. Stubblefield of Nashville read his paper, entitled "A Bird's-Eye View of Pathology."

The paper was discussed by Drs. W. C. Barrett and James Truman.

On motion, the subject was passed, the essayist closing the discussion.

Dr. C. N. Peirce of Philadelphia read his paper, entitled, "Third Molars."

Dr. H. J. Burkhart presented a further report of the Council.

Dr. J. D. Patterson made an announcement regarding the Executive Committee, and the Secretary announced time and place of meeting of the Sections, when the meeting was adjourned until 7:30 p. m.

FIRST DAY—EVENING SESSION.

The evening session was called to order at 8 o'clock by the President. The minutes of the morning meeting were read and approved.

Dr. H. J. Burkhart presented the report of the Executive Council on program, which was adopted.

The paper on "Third Molars," by Dr. C. N. Peirce, read at the morning meeting, was then discussed by Drs. J. Y. Crawford, A. H. Thompson, J. Taft, J. D. Patterson and James Truman.

On motion, the subject was passed, the essayist closing the discussion.

Dr. A. H. Thompson of Topeka, Kan., read his paper, entitled "Ethnographic Odontology; the Inca Peruvians," illustrated by lantern slides.

On motion, the discussion of the paper was postponed until the morning meeting, and Dr. Truman W. Brophy of Chicago gave a "Stereopticon Lecture on Surgery of the Palate," the discussion of which was also postponed until the morning meeting.

An announcement was made by Dr. J. D. Patterson with reference to the arrangements made with the railroads for transportation, and he requested that all certificates be handed to the Secretary.

The President announced the time for holding the morning meeting, and also the names of the three Commissioners, in accordance with resolution No. 2, relating to the proposed International Dental Congress. The Commissioners appointed were Drs. Eugene H. Smith, Truman W. Brophy and William C. Barrett.

The President also made an announcement regarding the Executive Committee and Executive Council, when the meeting was adjourned to 10 o'clock Tuesday morning.

SECOND DAY—MORNING SESSION.

The morning session was called to order at 10 o'clock by the President.

Minutes of the previous meeting were read and approved.

Dr. H. J. Burkhart read the report of the Council, announcing that credentials would be given to those in good standing in the National Dental Association wishing to attend the Stockholm meeting. The Council also recommended that in the discussions each speaker be limited to five minutes, and should he speak twice, not more than ten minutes in all. The program was announced, and, on motion, the report was adopted.

The paper of Dr. A. H. Thompson, read at the preceding meeting, was then discussed by Drs. C. N. Peirce, Cox and Brigham, the essayist closing the discussion.

The time and place of meeting of Section III was announced by the Secretary.

The stereopticon lecture of Dr. T. W. Brophy, given at the preceding meeting, was then discussed by Drs. W. J. Roe, B. G. Maercklein, Thomas Fillebrown and R. Ottolengui, the essayist closing the discussion.

Dr. W. J. Roe of Philadelphia read a paper entitled "Bilateral Bony Ankylosis of the Temporo-Maxillary Articulation of Traumatic Origin, and Its Surgical Treatment, with Report and Presentation of Two Cases Recently Treated by Operation."

The paper was discussed by Drs. M. H. Cryer, G. V. I. Brown, J. D. Patterson, Truman W. Brophy, M. L. Rhein, M. I. Schamberg, J. Y. Crawford, J. Taft and S. W. Foster. The subject was passed, the essayist closing the discussion.

A paper was read by Dr. J. D. Patterson of Kansas City on "Surgical Procedures in Diseases of the Maxillary Sinus," which was discussed by Drs. M. L. Rhein, W. H. G. Logan, R. H. Hofheinz, T. L. Gilmer, T. W. Brophy, J. Y. Crawford, G. V. I. Brown, B. G. Maercklein and C. P. Pruyn, the essayist closing the discussion.

On motion, a vote of thanks was extended to Dr. Roe for his valuable paper, to which the Doctor responded briefly.

The President announced that the Council would meet at 3 o'clock.

Dr. J. D. Patterson made an announcement with reference to the Executive Committee, when the meeting was adjourned to 8 p. m.

SECOND DAY—EVENING SESSION.

The evening session was called to order at 8 o'clock by the President.

Minutes of the previous meeting were read and approved.

The Secretary read the following communication from The Carborundum Company, extending an invitation to the Association to visit their works:

Niagara Falls, N. Y., July 29, 1902.

Dr. J. A. Libbey,
President, National Dental Association,
In Session, Niagara Falls, N. Y.

DEAR SIR:—Will you kindly extend to the members of the National Dental Association the freedom of our works for the purpose of inspecting the manufacture of carborundum and its different products?

That the members may be shown every attention possible, we have supplied Lee S. Smith and Son with passes. Any member applying at the exhibit of Lee S. Smith and Son, Room No. 1, International Hotel, may secure a pass. Our works are located one-quarter mile east of the Niagara Falls Power Co. Power House.

Electric cars for Buffalo; also local cars marked "Power House" pass our works. We trust every member of the Association will find it convenient to call upon us.

Yours very truly,
THE CARBORUNDUM COMPANY,
Geo. R. Rayner, Secretary.

Dr. H. J. Burkhart announced that The Power Company had invited the members of the Association to visit the Power House Wednesday afternoon.

On motion, a vote of thanks was extended to both corporations.

A letter was read by the Secretary from Dr. Dwight M. Clapp, with reference to the appearance of his name on the program for a clinic, which he was not present to give:

Boston, July 22, 1902.

President, National Dental Association,

DEAR SIR:—On the program for the meeting of the National Dental Asso-

ciation, just received, I find my name down for a clinic. This implies that I agreed to give a clinic, and, not being there, that I fail to keep my engagements. This annoys me greatly, and I ask you, as a special favor to me, to make public announcement of this mistake in the program.

When asked if I would give a clinic, I replied that I would gladly do so, if possible, not thinking for a moment that I was to be put on the list without further consultation.

When I make an engagement I keep it. This kind of publicity without doing my part is very distasteful to me.

Hoping you will do me the favor I ask, and that the meeting will be successful in every particular, I remain, Very truly yours,

DWIGHT M. CLAPP.

The Chairman of Section VI made an explanation regarding the matter.

The Secretary read a communication from Dr. C. E. Bentley, Chairman of the Odontographic Society of Chicago, inviting the members of this Association to be present at the celebration of the fifteenth anniversary, Feb. 16 and 17, 1903.

Dr. H. J. Burkhart read the report of the Council on program, and also a resolution in regard to awarding the contract for the publication of the proceedings to THE DENTAL DIGEST. (See Minutes of Executive Council.)

On motion, the report was adopted.

Dr. H. J. Burkhart read resolutions presented by Dr. Ottolengui to the Executive Council, with reference to the indorsement by this Association of an amendment to the Patent Laws:

WHEREAS, Thirty-six dental societies having endorsed an appeal to the Congress of the United States for an amendment to the patent laws, prohibiting the granting of an objectionable class of process patents relating to dental practice; and,

WHEREAS, Upon such endorsement, the New York State Dental Society having delegated Dr. R. Ottolengui a committee to further such legislation; and,

WHEREAS, Dr. Ottolengui, acting as such committee, and as the representative of numerous other societies, who contributed financially for this cause, and with the assistance of Dr. Emory A. Bryant, having introduced such a bill, and having thus far obtained the unanimous favorable report on this bill from the House Committee on Patents;

Resolved. That the National Dental Association endorse Bill No. 12451 of the House, and urge its immediate passage by Congress; and,

Resolved, That this Association appoints as its Committee to further this

legislation, Dr. R. Ottolengui of New York, Dr. Emory A. Bryant and Dr. M. F. Finley of Washington, D. C.

WHEREAS, The National Dental Association, the representative body of American dentists, being interested in House Bill No. 12451, introduced by Mr. George W. Taylor of Alabama, and recognizing the able, zealous and untiring labor which the Hon. Mr. Taylor has expended to gain the unanimous approval of the bill by the Patent Committee of Congress;

Resolved, That this Association extends its heartfelt thanks to the Hon. George W. Taylor of Alabama.

On motion, the resolutions were adopted.

Dr. Burkhart made an announcement regarding program.

A paper was read by Dr. Geo. V. I. Brown of Milwaukee, entitled "The Lower Jaw in Pathogenesis," which was discussed by Drs. R. H. Hofheinz, M. L. Rhein, R. Ottolengui and Grant Molyneaux.

On motion, the subject was passed, the essayist closing the discussion.

A paper was read by Dr. C. S. Case of Chicago on "A New Form of Artificial Palate."

The discussion was opened by Dr. R. Ottolengui, and continued by Drs. Thomas Fillebrown, G. V. I. Brown and Grant Molyneaux.

The subject was passed, the essayist closing the discussion.

On motion, a vote of thanks was extended to Dr. Case for his paper, to which the Doctor responded briefly.

The meeting was then adjourned until 10 o'clock Wednesday morning.

THIRD DAY—MORNING SESSION.

The morning session was called to order at 10 o'clock by the President.

Minutes of previous meeting were read and approved.

Dr. H. J. Burkhart read the report of the Council, recommending that the consideration of the proposed new Constitution and By-Laws be made a special order of business for 12:30 o'clock; also recommending that this Association discountenance the use of the term "Surgeon Dentist," substituting the term "Dentist" or "Dental Surgeon." (In accordance with resolution, Minutes of Executive Council.)

The announcement of program was made. Dr. Burkhart also an-

nounced a meeting of the Executive Council for 4 o'clock, the excursion to the Power House and Carborundum Works for 3 o'clock, and a report of Dr. J. N. Crouse, Chairman of the Prosecuting Committee.

On motion, the report of the Council was adopted.

Dr. J. N. Crouse, chairman, then read his report on the prosecution of bogus dental colleges.

Report of Prosecuting Committees.

Your committee, appointed by the National Dental Association at Milwaukee, August last, to investigate and prosecute the bogus and disreputable colleges said to exist in this country, beg leave to submit the following report:

As a nucleus for our investigation we had certain reports from the American Consul, James H. Worman of Munich, who met with us at Milwaukee. The corruption and discredit in this country was brought about by two different elements, or forms of organizations, namely, the state boards and disreputable colleges. The wrongdoings and frauds practiced upon students in the disreputable schools, and especially the diplomas issued, were almost exclusively to parties who came here from foreign countries for the purpose of getting these parchments. But in order to make these effective it was necessary to have the endorsement of the local state government, and this was brought about by getting state board certificates on these diplomas.

It will be remembered that the Governor of the state of Illinois, in connection with our movement, removed all of the former state board, and pending his new appointment, your chairman, with some others, visited the Governor, with a view of getting an incorruptible board of examiners. With the exception of Dr. Reid, an entire new board was appointed.

This being accomplished, the next step was to investigate the doings of the retired board as the instrument that made the wrongdoings of the colleges effective. While we had expected to accomplish this with the evidence in the possession of Mr. Worman, we found when this was written out and in form for examination that

it possessed no value in the way of evidence. But following out other lines we soon obtained evidence enough where parties had purchased certificates from certain members of the state board, paying a fee for them, varying in amount from $50 to $500. In this connection let us explain that this was not done by the entire board, but by three members constituting a quorum, who were able to carry on this nefarious traffic to an alarming extent. Having accumulated evidence in several different cases where the secretary of the board, Dr. Jacob H. Smyser, had sold these licenses, and also had falsified the records of the board, we had little difficulty in getting him indicted before the grand jury, and such indictments remain now for prosecution in the State's Attorney's office at Chicago. In addition to this, we obtained evidence of one Flynn, who was the detective for the state board, having issued and sold licenses purporting to be from the board which were forgeries. He also is under indictment.

Our investigation up to this time had not given us definite evidence against the corrupt colleges, some of the officers of which we believe to have been the indirect cause of the corruption of the board. The new board organized, adopted rules and regulations for their government, and on their knowledge of the disreputability of the German-American Dental College refused to grant certificates or licenses to practice in the state of Illinois on the diplomas of that institution, and on such refusal the college brought mandamus proceedings to compel the board to issue the license.

Before this occurred your committee had obtained a large amount of important evidence from former students of the college, mostly from Germany. The most important of these was one Miss Mueller, who, having become dissatisfied with the treatment she received at the German-American Dental College, abandoned that school, and matriculated and graduated, after three years' study, from one of the reputable colleges in Chicago. It was from her that we learned of a number of others who were dissatisfied, and who, having matriculated more recently, gave us just the evidence necessary to bring out the facts and expose the abuses of this school. We had already taken their testimony before a master, so that when the suit came to a hearing on the mandamus proceedings we were fully prepared to meet the issue. Stipulations having been entered into by our attorney and that of the college, the case was heard, and is

now in the hands of the judge. On account of pressing business he has postponed his decision for two weeks, so it is impossible for us to give a full report on this suit, but we have no doubt, and this is the opinion of our attorney and everyone who has listened to the trial, that there can be but one result, namely, that the German-American Dental College must be declared disreputable by the officials.

During this investigation and the examination of the witnesses already spoken of, we collected a large amount of evidence which will enable us, if the investigation is continued, to bring this and some other disreputable institutions into the Criminal Court and, we think, mete out to them the punishment they deserve.

As this investigation was contemplated by two different organizations, the National Dental Association and the College Faculties' Association, your committee, by appointment, met with the Foreign Relations Committee of the latter body in Chicago last December, and entered into an agreement and understanding with that committee, which resulted in the committee appointed by the National Association taking charge of and acting as the prosecuting committee of the College Faculties' Association under the supervision of their Foreign Relations Committee. The desirability of such an arrangement was evident, in order not to have two different committees laboring in and for the same cause, thus increasing the expense and causing other complications by pursuing different lines of action. This report, therefore, includes the report for both organizations, except in so far as the finances are concerned.

There was another interest which entered into this investigation, namely, the profession in Illinois, as it was agreed that the dentists of Illinois should take care of the expense of the prosecution of their own Board, and Illinois is providing a separate fund through the Illinois State Dental Society, which fund will be used in paying the expense of the prosecution of the indicted parties connected with the State Board, and your committee have made a separate financial statement for this part of the work, also one for the National and the Faculties' associations. These reports are submitted with the report just given. This can be considered only as a partial report, or one of progress, as the work of the committee is not yet finished.

With a view of obtaining evidence, your committee issued a

circular to the dental profession in certain parts of Europe and this country, with a view of finding out where questionable parties had graduated and from what schools, and also published in this circular a list of the schools that were classed as reputable. This circular has not been in the hands of the profession long enough to ascertain what the full result will be, but we predict that something will come from it if the work is continued.

Thus briefly we have stated something of what the Committee have been doing, all of which is signed and submitted by the committee.

On motion, the report was accepted, and the committee continued.

It was moved that an order be drawn on the Treasurer, when the funds are available, for $500.00, to be used for the purpose for which this committee was appointed—this to be in addition to what was appropriated last year. The motion was carried.

Dr. Chas. L. Hungerford of Kansas City read a paper entitled "A Plea for Uniformity in the Preparation of Roots and the Construction of Bridgework."

The Secretary made an announcement with reference to the railroad certificates.

The paper of Dr. Hungerford was discussed by Drs. J. Y. Crawford, Thomas Fillebrown, J. N. Crouse, G. V. Black, D. R. Stubblefield, R. H. Hofheinz, J. D. Patterson, John E. Wilkinson, Cox, M. L. Rhein, James McManus, J. P. Root, E. D. Bryan, F. B. Noyes, N. S. Hoff, Andrew J. Flanagan, Brigham, C. F. Bliven, Geo. D. Sitherwood and W. C. Wendel.

The hour of 12:30 having arrived, the unanimous consent of the Association was asked to waive the special order of business and substitute the time of 8 o'clock, which was refused.

On motion, the hour appointed to consider the special order of business was reconsidered.

Dr. H. J. Burkhart presented a report of the Council, recommending that the hour of 8 o'clock be devoted to the special order of business.

On motion, the report was accepted.

Dr. Hungerford's paper was then further discussed by Drs. E. D. Bryan, A. C. Hewett, S. W. Foster and J. Y. Crawford.

On motion, the essayist closed the discussion, and the subject was passed.

The meeting was adjourned until 8 o'clock p. m.

THIRD DAY—EVENING SESSION.

The evening session was called to order at 8 o'clock by the President.

Minutes of the previous meeting were read and approved.

Dr. H. J. Burkhart read a recommendation by the Council, that a committee of three be appointed to take into consideration the revision of the Constitution and By-Laws, and report at the next annual meeting.

On motion, the recommendation was adopted.

Dr. G. V. Black outlined a plan of revision to be presented to that committee for their consideration.

Dr. Burkhart reported an amendment to the By-Laws, to lie on the table for one year, that Section 1 of Article XII be changed so as to read as follows:

Section 1. The annual meeting of this Association shall begin on the last Tuesday of July of each year, unless otherwise determined by vote of the Association at the annual meeting. The sessions shall continue four days.

Dr. Burkhart also reported the following standing resolution:

Resolved, That the Secretary of the Association and the Chairmen of the Sections shall be a committee on program, and it shall be the duty of this committee to prepare and publish a program for each annual meeting of this Association, and mail a copy to each member at least one week before the commencement of the meeting.

On motion, the report was adopted.

The following report was then read:

Committee's Report on the President's Address, as Amended by the Council.

In compliance with the President's suggestion, it is recommended that the National Dental Association appoint a committee of three, with power to act in the matter of affiliation with the National University of Washington, D. C., and that as the Dental Society of the

State of New York has already taken the initiative step, it be given representation on the Committee.

Regarding the President's suggestion that every local society represented in the National Dental Association contribute the sum of one dollar for each delegate to whom it is entitled for purposes of furthering the interests of the National Dental Association, your Committee would suggest that a committee be appointed to communicate with the local societies and learn their disposition in the matter.

Concerning the transfer of the M.D.S. for the D.D.S. degree in the State of New York, your Committee is of the opinion that the National Dental Association should express itself very emphatically against any such proposed transfer, and that the Secretary be instructed to forward a copy of this resolution to the Secretary of the Regents.

Your Committee respectfully approves the recommendation that the Committee on Army and Navy Legislation be continued, and advises that the rank which should be asked for Army and Navy Surgeons be left to the discretion of said Committee.

With regard to the suggestion relative to the collection of data on the condition of the teeth of children of the public schools, your Committee recommends that this matter be referred to the Committee of this Association on Oral Hygiene.

Respectfully submitted,

Committee { GEO. V. I. BROWN, Chairman. C. N. JOHNSON. WILBUR F. LITCH.

On motion, the report was adopted.

The Council reported Resolution No. 3, in relation to proposed International Congress:

No. 3.—*Resolved*,, That a committee of fifteen be appointed by the President of the National Dental Association for the purpose of taking charge of an International Dental Congress, proposed to be held at St. Louis, under the auspices of the Louisiana Purchase Exposition, in 1904. Such Committee to have full power to organize and conduct the Congress. This Committee, when appointed, to be for the present a provisional committee subject to the acceptance of an invitation now on its way to the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Dental Congress. In the event of the acceptance of this invitation

by the Federation Dentaire International, the said Committee to be forthwith clothed with full power to commence and continue the work of organization. In case of a vacancy by death, resignation or otherwise, the Committee shall have power to fill the same.

On motion, the resolution was adopted, the Chair to announce the committee later.

Dr. Burkhart reported the program; also that the special order of business for 11:30 o'clock at the next meeting would be the election of officers.

A meeting of the Executive Council was announced.

On motion, the report was adopted.

A report of the Committee on Army and Navy Legislation was read by Dr. Williams Donally.

On motion, the report was accepted, and the Committee continued.

Dr. John Hess of West Point read a report on behalf of the dental corps of the army.

A report of Dr. Robert T. Oliver, supervising dental surgeon U. S. A., stationed in the Philippines, was read by Dr. C. S. Butler. On motion, the report was accepted, to be printed in the Transactions.

Dr. Charles McManus, Chairman of Committee on History, read a report, and on motion the report, with the recommendations of the Committee, was adopted.

A lantern lecture was given by Dr. M. H. Cryer.

Dr. F. B. Noyes read a paper, illustrated by lantern slides, on "The Structure of the Enamel in Its Relation to the Formation of the Walls and Margins of Cavities."

On motion, the discussion of the papers of Drs. Cryer and Noyes was postponed until the next meeting.

The meeting was then adjourned until 10 o'clock Thursday morning.

FOURTH DAY—MORNING SESSION.

The morning session was called to order at 10 o'clock by the President.

Minutes of the previous meeting were read and approved.

Dr. H. J. Burkhart read a resolution presented by the Council, regarding the proceedings of the Association:

Resolved, That the proceedings of the National Dental Association, and of the Southern Dental Association, are the exclusive property of the National Dental Association, after they have been presented to and read before the said Associations; and that in view of this ownership the dental journals cannot appropriate and publish any of said proceedings without the consent of said National Dental Association, and that in the future no part of the proceedings of either of the Associations that have been previously published will be included with or published in the said proceedings of the National Dental Association.

The resolution to be acted on in 1903.

The Council reported through Dr. Burkhart that the committee appointed to examine the books of the Dental Protective Association found them correct, and that the Association is in good financial standing. The Council also reported that the Treasurer's accounts have been examined and found correct. The program was announced, and the report was adopted.

The Secretary asked that the sections that had not organized for the coming year do so as soon as possible.

Dr. V. H. Jackson read the report of the Committee on Credentials, which was adopted.

The report of Section II was read by Dr. M. F. Finley, Secretary, and adopted.

Dr. Nones, Chairman of Section VI, presented the following report on Clinics, which was adopted:

Report of Chairman of Section VI.

The Committee desires to report the following clinics given:

1. Dr. M. I. Schamberg, Philadelphia, "The Surgical Removal of the End of a Root for the Cure of An Apical Abscess."

2. Dr. William A. Heckard, Indianapolis, Ind., "Preparing Sensitive Cavities and Removing Live Pulps Painlessly."

3. Dr. Joseph Head, Philadelphia, "Bleaching Enamel of Live Teeth."

4. Dr. V. E. Barnes, Cleveland, "Modifications of Well-Known Regulating Appliances."

5. Dr. D. O. M. Le Cron, St. Louis, "Porcelain Art as Applied to Dentistry."

6. Dr. Llewellyn F. Davis, Washington, D. C., "The Use of Pinless Vulcanite Teeth in the Construction of Crown and Bridge Work."

7. Dr. D. J. McMillen, Kansas City, Mo., "Non-cohesive Gold Filling, Using Abbey's Gold."

8. Dr. W. V. B. Ames, Chicago, "Showing Models Representing Results of Splints for the Retention of Loose Teeth, as per paper read at Milwaukee, 1901."

9. Dr. Wilbur M. Dailey, New York, "Manipulation of Soft Gold Foil, Showing Methods of Preparing Cavities, Points for Packing, etc."

10. Dr. H. A. Pullen, Buffalo, "Automatic Orthodontia Soldering Clamps."

11. Dr. O. H. Simpson, Dodge City, Kan., "New Swaging Device Not Obtaining Die Direct from Impression."

12. Dr. M. L. Rhein, New York, "Demonstration of Methods of Making and Setting Porcelain Roots by Means of Specimens and Charts."

13. Dr. R. Beck, Chicago, "Subcutaneous Injections of Paraffin in a Pronounced Case of Absorption of Alveolar Process; also the Use of Paraffin for Root Fillings."

14. Dr. W. T. Reeves, Chicago, "Porcelain Inlays—Matrices and Color Schemes, Using "Fellowship" Cement.

15. Dr. G. A. Gray, Worcester, Mass., "Porcelain and Gold Fillings."

16. Dr. C. Frank Bliven, Worcester, Mass., "Amalgam Veneers."

17. Dr. W. E. Griswold, New York, "Dr. Griswold's System of Removable Bridgework."

18. Dr. A. N. Gaylord, Philadelphia, "Cavity Preparation in Porcelain Teeth for Gold Fillings."

19. Dr. Wm. Crenshaw, Atlanta, Ga., "Demonstration of a Contour Matrix."

20. Dr. J. W. Cowan, Geneseo, N. Y., "Demonstration of a Floss-silk Holder."

21. Dr. Gordon White, Nashville, Tenn., "Case of Pyorrhea."

22. Dr. R. B. Tuller, Chicago, "Demonstrating with Special Instrument for Pressure Anesthesia."

Dr. J. Taft, Chairman of Committee to Arouse Interest in and

Cooperation of the Various Local and State Societies in the Work of the National Association, made the following report:

Your Committee has been so situated that it was impossible to have a conference during the year, but the members of the Committee have been doing something in the way of visiting local and state societies, and a good deal of work has been accomplished. Dr. Charles McManus has done a large amount of work in the eastern states that will bear fruit in the future. The other members of the Committee have been at work at other points, and considerable has been done, especially in stimulating state societies to greater activity.

Not much has yet been done in conference with local societies, but we hope in the near future that all these throughout the country (which are perhaps the most important in some respects) will be reached through the issuing of circular letters, letters of information and suggestion. By such means it is hoped that local societies will be stimulated to greater activity, new societies formed, and that their work will be of a more aggressive character than heretofore. It is hoped that there will not be a district in the country that will not have its local dental society. The state societies are greatly influenced and stimulated in their work when the local societies are in active operation.

It is a matter of regret that we did not have a written report, but under the circumstances it seemed impossible. We suggest that the committee be enlarged, or some additional influence be put forth and exercised for the promotion of this work. Three persons, one in the east, one in the center, and one in the west, are hardly sufficient to cope with this subject. There ought to be a member of this Committee in every state in the Union, and it is here suggested that the state societies might indicate this person. There are many lines of work and operations that have occurred to the Committee which would be very valuable if there were force and power to put them in operation.

Committee { J. TAFT, *Chairman.*
H. W. MORGAN.
CHARLES MCMANUS.

On motion, the report was accepted, and the committee continued.

The President reappointed the members of the Committee for another year, except that Dr. James McManus was appointed in place

of Charles McManus, and the Committee was instructed to appoint a member in each state, as suggested by Dr. Taft.

The report was then accepted.

Dr. J. Taft, Chairman of the Committee on Necrology, made a partial report. The Committee was authorized to complete the report and hand it to the Secretary when finished. Following is the complete report:

Report of Committee on Necrology.

Dr. Charles Essig.

Died at his residence, Wallingford, Pa., December 2, 1901, after a short illness, from pneumonia, in the sixty-first year of his age. Dr. Essig was born in Philadelphia, July 23, 1841. His first connection with the dental profession began September 10, 1857, when he entered the laboratory of Dr. Wm. R. Hall, where he received his first instruction in prosthetic dentistry. In due time Dr. Hall transferred his laboratory and practice to Dr. Essig, who for some years conducted it successfully, doing prosthetic work for dentists throughout the country. On January 5, 1870, he became associated with Dr. Louis Jack, with whom he continued until 1875. Upon leaving Dr. Jack, he continued his practice in Locust street, Philadelphia, for a period of eighteen years.

In 1871 the degree of Doctor of Dental Surgery was conferred upon him by the Philadelphia Dental College, where he had been instructor in prosthetic dentistry. Later he became professor of Mechanical Dentistry and Metallurgy in the Pennsylvania College of Dental Surgery, and was for several years its Dean. Dr. Essig graduated from the Jefferson Medical School in 1876. In 1878 he was one of the organizers of the Odontological Society of Philadelphia, and was its President for several years. Under the leadership of Dr. Essig began the organization of the Department of Dentistry of Pennsylvania University. Associated with him were Professors E. T. Darby, Geo. T. Baker and Dr. James Tyson.

In February, 1878, the Dental Department of the University of Pennsylvania was organized, with Dr. Essig as Secretary and Professor of Mechanical Dentistry and Metallurgy. The department

began its educational work in the spring of the same year, with a class of fifty-eight students. In 1882 Dr. Essig, finding the duties of Dean required more time and attention than his practice would permit, resigned that position, still retaining his professorship until July 3, 1901, when he resigned the Chair of Prosthetic Dentistry and Metallurgy, which severed his connection with the University of Pennsylvania, after a period of service in that institution of twenty-three years.

Dr. Essig inherited a taste for literary work, and during his professional career was active in dental literature, making frequent contributions to the different journals. His first publication appeared in book form as a treatise on "Dental Metallurgy," published in 1882. This volume has been translated into several languages, and is used as a text-book in this country and Europe. This was followed in 1897 by the "American Text-book of Prosthetic Dentistry," a collaborative work of which he was the editor and to which he was a large contributor.

Dr. Essig was a representative man in his profession. As practitioner, teacher and writer, his labors embraced one of the most important, not to say critical, periods of the growth of dentistry as a profession. He was essentially an artist by training, disposition and temperament. These qualities were expressed in whatever he produced, and were the keynote in his teachings. He regarded dental prosthesis as a fine art, and so treated his work as to practically embody that idea. He exhausted the artistic possibilities of the materials at his disposal. When the introduction of the vulcanite base threatened to displace the higher grade of restorations on the metallic base, Dr. Essig was among the very earliest to experiment with the vulcanite with reference to its possibilities, and to so systematize its method of manipulation as to make it available for the production of artistic results and practical utility. He kept alive the older artistic ideals in dental prosthesis, and helped to inspire others with a respect for his specialty during the period of its decadence, due to the indiscriminate use of vulcanite. His teaching was based upon practical experience. Thousands of young men whom he taught are able to testify to the practicability and usefulness of the methods which he imparted to them.

His death brought a shock of surprise and sorrow, not only to

those who knew him personally, but to that still wider circle who looked upon him as a teacher and leader, a sound guide in prosthetic work, but perhaps nowhere outside of his family has his death produced more real sadness and sorrow than in the membership of this body. Truly, the loss of him and such as he makes a breach in this Association not easily repaired.

Dr. Essig was married in 1868 to Miss Mary Sturges of Philadelphia. His widow and two sons, Dr. Norman S. and Dr. Geo. S., both of whom are practitioners of dentistry, survive him.

Dr. Henry Bliss Noble.

Died suddenly from heart disease on the morning of March 3, 1902, in Washington, D. C. Dr. Noble was born May 20, 1832, in Blandford, Mass. He began the study of dentistry with his brother, Dr. Lester Noble, March 2, 1857, and after graduating at the Baltimore College of Dental Surgery, March 3, 1859, at once entered upon the practice of dentistry in Washington, D. C., continuing in active practice until his death. He was a member of the District of Columbia Dental Society, having been twice elected its President, and a member of the District of Columbia Board of Dental Examiners from the date of its organization until his death. He was also a member of the National Dental Association, and was one of its most interested and active members for many years. He was also an active member of the Dental Section of the International Medical Congress, held at Washington in 1881, and in the organization of the Columbian Dental Congress, held in 1893 at Chicago. He did much to make its work a success, and his efforts were highly appreciated by his co-laborers; indeed, by all who knew him. He was special lecturer at the Baltimore College of Dental Surgery, and also at the Dental Department of Columbia University.

In 1864 he was married to Miss Henrietta Clitch of Washington. Three daughters survive him, Miss Irene Noble; Mrs. Clagett of Linden, Md., and Mrs. Marshall of Pittsburg. Dr. Noble's wife died several years ago. A son, who became a practicing dentist, also died several years ago. These two events made a very serious impression upon him, and doubtless had much to do with breaking down his strong constitution.

Dr. Noble was a very successful practitioner in all the branches of his profession, and especially in orthodontia. He was ever devoted to his profession, and always enthusiastic and energetic in his efforts to promote its advancement. Notwithstanding that he was well along in life, he was always young in his devotion to his calling. He was loyal to his friends, always beloved by them, and respected as a citizen; faithful in his devotion to his church, benevolent and kind, his attitude was one of malice towards none and charity for all. Faithful, honorable and upright in all of his life relations, his presence was always appreciated and enjoyed by the membership of this body in its annual meetings. The memory of him will doubtless remain green in the thoughts of all who knew him.

Committee { J. TAFT. E. S. GAYLORD. W. E. BOARDMAN.

Dr. W. V-B. Ames made an explanation in regard to his vote on publishing the Transactions.

Dr. J. D. Patterson announced a meeting of the Executive Committee, and announcements were made regarding the meetings of the Sections.

A paper by Dr. Andrew J. Flanagan of Springfield, Mass., was then read, entitled "Some Thoughts on the So-Called Preliminary Requirements."

The paper was discussed by Drs. G. V. I. Brown, E. D. Bryan, J. N. Crouse, J. D. Patterson, and Wm. Crenshaw. Dr. Flanagan closed the discussion and the subject was passed.

Drs. Grant, Loudon and Hart were appointed tellers for the election.

Invitations from Asheville, N. C., requesting the Association to meet there in 1903, were read by the Secretary.

On motion, the Secretary cast the unanimous ballot of the Association in favor of Asheville, N. C., as the next place of meeting.

The result of the election of officers was as follows:

President, L. G. Noel, Nashville.

Vice-President for South, S. W. Foster, Atlanta.

Vice-President for West, C. C. Chittenden, Madison, Wis.

Vice-President for East, Chas. McManus, Hartford, Conn.

Corresponding Secretary, W. D. Tracy, New York.

Recording Secretary, A. H. Peck, Chicago.

Treasurer, Henry W. Morgan, Nashville.

Executive Council: H. J. Burkhart, Batavia, N. Y.; B. Holly Smith, Baltimore; J. Y. Crawford, Nashville; M. F. Finley, Washington; Waldo E. Boardman, Boston.

Executive Committee: J. D. Patterson, Kansas City; H. A. Smith, Cincinnati; T. S. Waters, Baltimore.

The various sections were organized by the election of:

Section I. Hart J. Goslee, Chicago, Chairman; Wm. Ernest Walker, New Orleans, Secretary.

Section II. Andrew J. Flanagan, Springfield, Mass., Chairman; C. S. Butler, Buffalo, Secretary.

Section III. R. H. Hofheinz, Rochester, N. Y., Chairman; F. B. Noyes, Chicago, Secretary.

Section IV. J. D. Patterson, Kansas City, Chairman; Emma Eames Chase, St. Louis, Secretary.

Section V. Thos. Fillebrown, Boston, Chairman; W. H. G. Logan, Chicago, Secretary.

Section VI. Robert H. Nones, Philadelphia, Chairman; Don M. Gallie, Chicago, Secretary.

The President appointed the following Committee on Carnegie Institute: Wilbur F. Litch, Philadelphia; William Carr, New York; B. Holly Smith, Baltimore.

Also the Committee on the International Congress for 1904, as follows: E. C. Kirk, Philadelphia; R. H. Hofheinz, Rochester; H. J. Burkhart, Batavia, N. Y.; Wm. Carr, New York; Waldo E. Boardman, Boston; V. E. Turner, Raleigh; J. Y. Crawford, Nashville; M. F. Finley, Washington; J. W. David, Corsicana, Tex.; Wm. Crenshaw, Atlanta; Don M. Gallie, Chicago; G. V. I. Brown, Milwaukee; A. H. Peck, Chicago; J. D. Patterson, Kansas City; B. L. Thorpe, St. Louis.

Also the Committee on Constitution and By-Laws: G. V. Black, Chicago; J. Y. Crawford, Nashville; Wm. Jarvie, Brooklyn.

On motion, the papers of sections which had not been read were referred to the Publication Committee.

A motion was made to tender the thanks of the Association to the manager of the International Hotel, Mr. S. A. Greenwood, for the

courtesies shown, and to the Hotel Company for the free use of the International Theater during the meetings. Carried.

Drs. S. W. Foster and G. V. I. Brown escorted the newly elected President, Dr. L. G. Noel, to the Chair.

Dr. H. J. Burkhart moved a vote of thanks to the retiring President, Dr. Libbey, for the successful manner in which he had conducted the meetings. Carried.

A motion was made to extend a vote of thanks to the Executive Council and Executive Committee. Carried.

On motion, a vote of thanks was extended to the Secretary for the able manner in which he had discharged his duties.

Dr. Williams Donnally moved a vote of thanks to Dr. H. W. Morgan, Treasurer.

On motion, a vote of thanks was extended to Dr. Robert H. Nones, Chairman of the Clinic Committee.

Dr. H. J. Burkhart moved that the Chair be empowered to appoint all standing committees, in accordance with the By-Laws, previous to publication of Transactions. Carried.

On motion, the reading of the minutes of the present meeting was dispensed with, and the Association was adjourned.

A. H. PECK,
Recording Secretary.

Minutes of the Executive Council.

First meeting called to order by Dr. H. J. Burkhart, Chairman, in manager's room of International Theater building, at 10 o'clock a. m., Monday, July 28.

Dr. E. C. Kirk spoke on the question of holding an International Dental Congress in St. Louis, in 1904, and presented the following three resolutions:

No. 1.—WHEREAS, In 1904 there will be held an International Exposition in St. Louis, Mo., U. S. A., to be known as the Louisiana Purchase Exposition, in connection with which provision has been made for the holding of a series of International Congresses, some of which are already organized; and,

WHEREAS, The dental profession in America have been requested to organize in connection therewith a congress which shall adequately represent the interests and attainments of dentistry; therefore,

Resolved, That the National Dental Association of the United States of America hereby invites the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Congress, to designate St. Louis, Mo., U. S. A., as the place, and the month of August, 1904, as the time, for holding said International Congress.

No. 2.—WHEREAS, The National Dental Association has adopted a resolution inviting the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Dental Congress, to designate St. Louis as the place, and August, 1904, as the time, for holding said Congress;

Resolved, That three Commissioners be appointed by the President of this Association to convey to the Committee of the Federation Dentaire International, having in charge the promotion of the Fourth International Dental Congress, the cordial invitation of the dental profession of America, through its National Association, to unite in the holding of a Congress, to be called the Fourth International Dental Congress, at the time and place stated.

No. 3.—*Resolved,* That a committee of fifteen be appointed by the President of the National Dental Association for the purpose of taking charge of an International Dental Congress, proposed to be held in St. Louis under the auspices of the Louisiana Purchase Exposition, in 1904. Such Committee to have full power to organize and conduct the Congress. This Committee, when appointed, to be for the present a provisional committee, subject to the acceptance of an invitation now on its way to the Committee of the Federa-

tion Dentaire International, having in charge the promotion of the Fourth International Dental Congress. In the event of the acceptance of this invitation by the Federation Dentaire International, the said Committee to be forthwith clothed with full power to commence and continue the work of organization. In case of a vacancy by death, resignation or otherwise, the Committee shall have power to fill the same.

Dr. J. D. Patterson, Chairman of the Executive Committee, presented a verbal report. On motion, the report was accepted.

On motion, resolutions Nos. 1 and 2, relating to the proposed International Congress, were recommended for adoption.

Dr. Thomas Fillebrown, Chairman of Section V, presented a report on the work of his Section.

The Secretary read his annual report. On motion, the report was accepted and the bills accompanying it were referred to the Auditing Committee.

Annual Report of Recording Secretary.

To the Executive Council of the National Dental Association.

GENTLEMEN:—Your Recording Secretary respectfully submits the following report:

A faithful and accurate record of the minutes of the last meeting was kept.

At the close of the meeting of 1901, I communicated with the members of the Association with a view of determining to which Section they wished to be assigned.

In accordance with instructions by the Association, your Secretary mailed to the members of the Association printed copies of the proposed new constitution and by-laws presented by Dr. G. V. Black. During March, 1902, under instructions by Dr. J. D. Patterson, Chairman of the Executive Committee, and Dr. J. A. Libbey, President of the Association, your Secretary took a postal card vote of the members on a proposed change of the opening date of the Association from the first Tuesday in August to Monday, July 28. The result of this vote was an overwhelming majority in favor of the proposed change.

The program was published and mailed to the members July 16.

Your Secretary has paid bills, postage, etc., during the current year to the amount of three hundred eighty-three dollars and forty-six cents ($383.46). This amount includes one hundred ($100) dollars appropriated by the officers of the Association to Dr. A. H. Thompson of Topeka, Kansas, to assist in defraying his expenses on a trip to Washington for the purpose of examining the skulls in the National Museum, in the interests of the Association.

Of this sum paid out by your Secretary receipted bills to the amount of three hundred forty-five dollars and thirty-six cents ($345.36) accompany this report. For the balance, thirty-eight dollars and ten cents ($38.10), an itemized statement is herewith appended.

Respectfully submitted,

A. H. PECK, *Rec. Secy.*

Approved July 29, 1902.

Auditing Committee. { V. H. JACKSON, T. S. WATERS, CHARLES MCMANUS.

The annual report of the Publication Committee was then read by the Chairman.

Annual Report of the Publication Committee.

The Publication Committee respectfully submits the following report:

In accordance with a vote of the Executive Council, Dr. J. N. Crouse, publisher of the DENTAL DIGEST, was accorded the transactions for publication, and was placed under bond to the amount of five hundred ($500) dollars to insure publication of the transactions not later than three months after all the subject matter should be placed in his hands by the Secretary.

Your Secretary regrets the necessity of reporting that publication of the transactions was delayed at least two months by his inability to get the proceedings of the Southern Branch in shape for publication. In spite of this, however, the transactions for 1901 were mailed to the members February 14, 1902, this being several months earlier than they have been distributed for several years past. After the usual distribution to members, journals, libraries, etc., there are about one hundred copies still on hand.

A. H. PECK, *Chairman.*

On motion, the report was accepted.

Adjourned to meet at 4 o'clock p. m.

Monday p. m. meeting was called to order by Chairman Burkhart.

Minutes of the previous meeting were read and approved.

Dr. R. Ottolengui presented a report on behalf of the New York State Dental Society regarding patent laws.

Action on this report was postponed to a future meeting.

The Secretary read communications from the DENTAL DIGEST, also from the *Dental Cosmos,* requesting the proceedings of the Association for publication.

It was moved that the proposition of Dr. Crouse, on behalf of the

DENTAL DIGEST, be accepted on condition that he conjointly with the Secretary becomes the custodian of the proceedings, until published, without expense to the Association.

Action on this motion was postponed.

Adjourned to meet Tuesday morning.

Tuesday morning meeting called to order by the Chairman, Dr. Burkhart, at 9 o'clock.

Minutes of the previous meeting were read and approved.

On motion, it was agreed that the President and Secretary should issue credentials to any members in good standing who wished to attend the Stockholm meeting.

The Secretary reported that he had informed Drs. Truman W. Brophy and W. C. Barrett of their appointment, by the President, with Dr. Eugene H. Smith, Chairman, as Commissioners in accordance with resolution No. 2 relating to the proposed International Dental Congress.

Dr. E. C. Kirk was requested to have engrossed a copy of the invitation to the Federation at Stockholm, and to report at the afternoon meeting.

On motion, it was recommended that it is the sense of the Executive Council that anyone discussing papers should not speak more than twice, nor longer than ten minutes in all.

Adjourned to meet at 3 p. m.

Tuesday afternoon meeting was called to order at 3 o'clock.

Minutes of the previous meeting were read and approved.

Dr. Kirk presented the engrossed copy of the invitation to the Federation at Stockholm provided for in resolution No. 2 relating to the proposed International Dental Congress. It being noticed that by an error Dr. Eugene H. Smith's name was mentioned last in the Commission, it was, on motion, directed that the Secretary write three letters, one addressed to Drs. Smith, Brophy and Barrett, respectively, to the effect that Dr. Smith is Chairman of the Commission, and that Drs. Brophy and Barrett, on their arrival at Stockholm, should deliver to Dr. Smith the engrossed copy of the invitation, together with any other official documents entrusted to their care relating to the proposed International Dental Congress. The engrossed copy of said invitation, together with these two letters

addressed to Drs. Brophy and Barrett, were entrusted to Dr. Kirk for deliverance to these two gentlemen.

Dr. Crouse spoke on the publication of the transactions. The subject was generally discussed.

Dr. Chas. S. Butler, Chairman of Committee on Volunteer Essays, spoke of Dr. Oliver's paper sent from Manila, P. I.

On motion, Dr. Butler was requested to read such portions of Dr. Oliver's paper as, in his judgment, seemed best.

It was moved and carried that the Council recommends that the proceedings of this Association, including the papers and discussions, be given to the DENTAL DIGEST for publication, provided the DIGEST publish same without expense to the Association, also that the DIGEST shall send galley proof to all other dental journals in the country for their use, provided the other journals do not print said papers and discussions until they appear in the DIGEST and that they credit the DIGEST with same when publishing them. Also that the Council request the *Dental Cosmos* to turn over to the DIGEST six hundred copies of proceedings of the Southern Branch for publication with the proceedings of the National. Also that the DIGEST hereby agrees to issue the book of transactions not later than three months after all matter is turned in by the Secretary, and as penalty for failure to comply with this last condition, the DIGEST hereby agrees to forfeit to the treasury of the National Dental Association, the sum of five hundred dollars.

On motion, the Council recommended that the resolutions presented by Dr. Ottolengui, regarding patent laws, be adopted.

Consideration of the proposed new constitution and by-laws, presented by Dr. G. V. Black at the Milwaukee meeting, was taken up.

Action on this matter was postponed to a future meeting.

Adjourned to meet Wednesday morning.

Wednesday morning meeting was called to order by the Chairman at 9 o'clock.

Minutes of the previous meeting were read and approved.

The following report from Section III was read and accepted:

REPORT OF SECTION III.

July 30, 1902.

To the Council of the National Dental Association.

GENTLEMEN: I take pleasure in presenting the following report:

After duly considering the essays brought before our Section, it has unanimously agreed to recommend these papers to be read before the Association: 1. "The Structure of the Enamel in Its Relation to the Formation of the Walls and Margins of Cavities," F. B. Noyes. 2. "The Face of Pluggers," E. A. Royce. 3. "Some Principles in Porcelain Inlay Work," W. T. Reeves. In connection with the paper presented by Dr. F. B. Noyes, I beg to state that his work was undertaken at the request of the former Chairman, Dr. T. E. Weeks, who promised the essayist the covering of the expenses connected with the preparation of said paper. The expenses incurred amount to $65.00, which I recommend to your consideration.

R. H. HOFHEINZ, *Chairman pro tem.*

The resignations of Drs. Lawrence P. Leonard, St. Cloud, Minn., and Wm. A. Lyon, Washington, D. C., were read, and, on motion, accepted.

The following resolution was read and on motion was recommended adopted.

WHEREAS, The title "Surgeon-Dentist" was arbitrarily created in the eighteenth century to designate a position that has long ceased to exist (namely, the appointed dental attendant to the King of France); and,

WHEREAS, This designation has long been obsolete;

Resolved, That this Association discountenances the use of this term and suggests the substitution of the word dentist, or words dental surgeon.

The report of Section I by Dr. Wm. Ernest Walker was presented, and on motion was accepted and referred to the Publication Committee.

Report of Secretary of Section I.

As Secretary of Section I, I beg to offer, as supplementary to the report of the Chairman of the Section, the following sketch of a small part of the journalistic literature of the year on Orthodontia. Opening a new office, and removal of residence from Mississippi to New Orleans, have broken into the completeness of my files, which are still scattered, and must be my apology for the incompleteness of this report of the work of the year along the lines of this section.

Etiology.—A valuable contribution to the subject of the devel-

opment of the maxillæ and teeth—the Influence of Nasal Obstruction—(1) was read by Gordon King, M.D., before the New Orleans Academy of Stomatology, in November last. The subject was selected by Dr. King as being one of equal interest to the dentist, the orthopedist and the rhinologist, and hence one of the material links tending to bind the professions together. He said that while to the dentist the chief importance attached to remedial measures to be applied, to the rhinologist is assigned the honor of having discovered the essential cause, and of applying the greatest of all remedies—*prevention.* These patients are as a rule seen by the dentist only when the deformity has already taken place, and the permanent teeth have erupted in irregular arrangement. Upon the rhinologist falls the burden of responsibility of laying proper stress upon the importance of abnormal conditions which may tend to a perversion of normal development; conditions the symptoms of which are too often overlooked or undervalued by parents.

Nasal obstruction, whether only partial or complete, leads to a compensatory habit of mouth-breathing, with all its deleterious effects, especially upon the development of the maxillary bones. That the most frequent cause of nasal insufficiency in children is the growth of adenoid vegetations in the naso-pharynx is universally admitted. A catarrhal state of the nasal and pharyngeal mucous membranes, and a more or less constant congestion of the upper respiratory tract, invariably accompany the presence of adenoids. The coexistence of hypertrophied faucial tonsils also affects the nutrition of adjacent organs. Next in frequency to adenoid growths is obstruction due to malposition and hypertrophies of the nasal septum, a thin plate of cartilage and bone especially prone to traumatic injury. When from these and other causes the habit of mouth-breathing is formed and the nasal functions are destroyed, the accessory cavities to the maxilla, the frontal and sphenoidal bones, whose functions are intimately connected with those of the nose, are arrested in their formation; the alæ of the nose atrophy from disuse and readily collapse against the septum, causing a partial vacuum in the nasal chambers, diminishing the resistance to atmospheric pressure from without, and causing a congestion of blood in the highly vascular lining membranes. This leads not only to a derangement of local nutritive processes, but the entire system is to a certain degree af-

fected in consequence. But of especial importance to us as orthodontists, said Dr. King, are the irregularities in the form of the palatal arch and the arrangement of the teeth, which are held to be familiar consequences, the abnormally high vault; the V-shaped arch; overlapping and prominent incisors; malposed cuspids; thin nose and flattened cheeks. The growth of the superior maxillæ is retarded; the lateral alveolæ approach each other as the anterior portions advance forward; the lateral incisors, cuspids and bicuspids are deranged in position. Dr. King discussed at length the various theories set forth as explaining the development of the abnormally high arch, according great weight to the influence of septal deviations, giving to post-nasal adenoids the first place as an etiological factor in the septal deviations of childhood. He said too great importance cannot be attached to free nasal respiration in childhood, and to an early recognition and treatment of conditions that produce nasal insufficiency. In conclusion he said, "We should always bear in mind that the ability to recognize conditions that may lead to disease or deformity bears with it a moral responsibility to which we should never be indifferent."

A paper by Nelson M. Black, M.D. (2) is worthy of the attention of everyone interested in this subject.

Dr. F. Parke Lewis read a paper on the same subject before the New York Institute of Stomatology. (3) He said, "Clinically the relationship between adenoids and deformities of the face has been so constantly observed that the facial appearance has come to be accepted as a characteristic indication of the presence of adenoid vegetations in the naso-pharynx." Dr. Lewis, however, takes a reverse view to that generally accepted, believing that in many cases a narrow head and face, produced by any means whatever, will naturally result in obstruction of the lymph passages, with all the varied and unfortunate phenomena which such obstruction implies. This being admitted, its import to the orthodontist is obvious, also the importance of recognizing even the less striking of these cases.

In the discussion of the paper Dr. Wendell C. Phillips stated that on an average one child in every eight or ten had adenoid vegetations, this being so out of proportion to the number presenting dental deformities that it seems rather to oppose the generally accepted theory. Dr. Lewis considers it the exception, rather than the rule,

that adenoids are the cause of high arched palates. Dr. Haskins thought that adenoids are often due to improper infant feeding, disturbances in the digestive apparatus being followed by congestion of the lymphatics of the mucous membrane.

Dr. Mayo Collier, in an address (4) on this subject delivered before the British Laryngological, Rhinological and Otological Association, said—"The association of mouth-breathing with high palate, unsymmetrical upper jaw, prominent nose, open mouth and thin, flattened face is a constant one. I am old enough now to have seen many children with beautifully formed faces, symmetrical dental arches and perfect nasal respiration become in after-life quite altered. The upper arch becomes so distorted that the molar teeth on each side are approximated, so that the teeth of the upper jaw rest only by their edges on the teeth of the lower jaw, whereas the incisor teeth of the upper jaw protrude forward and hang in front of the incisor teeth of the lower jaw. The whole of the upper jaw may become atrophied, the nasal respiration almost entirely suspended, the palate highly arched and V-shaped and the mouth constantly open. Why this change? * * * Hereditary tendency did not exist, the parents having remarkably well-formed upper jaws and being particularly good-looking. I can produce the same effect on any young animal chosen indiscriminately, by blocking its nose for a long time with cotton-wool. Is it unreasonable to suggest that turbinal atony and hypertrophy in the young and growing subject will act as the piece of wool in the nose of the young animal? * * * A small increase of pressure from without, constantly applied on the walls of the nasal box, is capable of pushing up the palate, disarranging the upper arch and causing general atrophy and an undeveloped condition of the whole upper jaw. Moreover, if these cases are taken at an early stage and the nasal respiration is restored, the constant stream of air passing through the nose molds and expands the upper maxillæ, and in time the greater part of the deformity will disappear."

Dr. Herbert A. Pullen, in closing the discussion of his paper (5), read before the Sixth, Seventh and Eighth District Dental Societies of New York, said that in his practice all cases of mouth-breathing were referred to the rhinologist, he refusing to undertake the correction of irregularities until the rhinologist pronounced the post-

nasal condition good. He said—"The effect of mouth-breathing is to cause the elongation of the molars because of the constantly open mouth. This of course produces an open bite, and the upper lip, relieved of tension, is shortened. The effect is pronounced, because as pressure is removed from the anterior teeth the jaw is narrowed, the occlusion destroyed, and in consequence nutrition is interfered with."

Dr. H. E. Lindas read before the Kansas State Association "A Study in the Etiology of Malocclusions." (6) He divides malocclusions into two classes; 1st, those which cause, and 2nd, those which are caused by, deformities of the maxillary bones. The first class includes those caused by pernicious habits in childhood and injudicious extraction, the results being generally confined to the alveolar portions, except those caused by premature extraction of deciduous teeth or extraction of permanent teeth before the jaws are developed. They are not infrequently intensified by attempting correction through extraction, thus destroying the mathematical perfection of the occlusal harmony. Deciduous teeth that are sensitive to pressure may indirectly cause malocclusion in the effort to avoid contact, the child taking advantage of the sliding movement of the temporo-maxillary articulation, and advancing the lower jaw until the habit is formed. In the second class the maxillæ may be either under or over developed as compared with the teeth, underdevelopment being by far the more prevalent. Diseases which effect malocclusion originate in the nasal fossæ, tonsils, and occasionally in the maxillary sinus. Adenoid growths and hypertrophied tonsils, causing stenosis of the nasal passages, cause characteristic malocclusion. There is seldom any evidence of underdevelopment of the maxillary bones before the sixth or seventh year, the age at which the child is peculiarly susceptible to hypertrophy of the fauces and tonsils. The maxillary bones then fail to respond to the demand for more room for the increased size of the permanent as compared with the deciduous teeth. Dr. Lindas concluded his paper by saying—"Practically all malocclusions are acquired, and by the elimination of extraction as a procedure in correcting malocclusions, and of inheritance as a factor in producing them, we may hope to make orthodontia an exact science."

Extraction—Pro and Con.—Dr. W. D. Tenison (7), while

disclaiming a radical standpoint, describes certain conditions under which extraction apparently becomes a duty. For instance, when a child is suffering from toothache, with exposed pulps in first molars, teeth of poor quality and showing tendency to decay, crowded and in abnormal position. Nonextraction would necessitate devitalized first molars, expansion of arch to ease off the pressure, separate points of contact, the wearing of retaining-devices, a source of danger to poor, soft young teeth; and the risk to the health of a delicate nervous child. On the other hand, extraction of all four first molars at the age when second molars are about to erupt offers a few years later "as near as possible a perfectly regular set of teeth, good articulation, little or no decay, not a dead tooth in either jaw, perfect comfort to the patient, who is able to masticate food perfectly, and, so far as the teeth are concerned, in perfect health, with no flattening or contracting of the arch, no straightening or shortening of the teeth, as has been claimed by those who denounce extractions."

Dr. Herbert A. Pullen, on the other hand, in the paper before referred to, on "Conservative Treatment in Orthodontia," says, "The most important tooth to preserve is the first permanent molar, especially the lower, yet its extraction because of caries seems to be a favorite and all too frequent practice. Its loss is followed by more serious results than that of any other tooth. * * * The four first molars are the foundations for the developing arches, both as to lateral and forward development, as well as preserving the proper relation and distance between the two arches until the remaining permanent teeth have erupted, and have been guided into position, confirming the occlusion already established by these four bulwarks of the dental arches."

In the discussion of this paper Dr. Eschelman (Buffalo) was strongly opposed to the extraction of the first molars. He said—"The first molars act as props to keep the jaws open till permanent teeth come in; they constitute the base of the arch of the jaw, and their removal disarranges the arch." Dr. Webster (Toronto) said, "Nearly all dentists are agreed that the anterior teeth should never be extracted in regulating, but too many are willing to sacrifice bicuspids to make room to correct irregularities. It is hard to conceive a case where such a sacrifice could be justified and the consequences are usually most lamentable."

Dr. R. E. Sparks, in a paper read before the Ontario Dental Society (8) discussed the indications for extraction or retention of the first molars, reaching the conclusion that it is impossible to lay down a set of rules which will cover all cases. In the discussion of the paper Dr. Pullen gave the following reasons for nonextraction—1st. They are the first of the permanent teeth to erupt, and during the period of absence of the temporary dentition afford the broadest and the best masticating surface in the mouth. 2nd. By reason of their great strength and size, these are the only teeth that can serve as a means of preserving the normal relationship between the jaws, and consequently the symmetry of the face, at a time when no others of the permanent set, except the incisors, are erupted to occlusion. 3rd. Their presence is an aid in securing developmental pressure in the development forward of the jaws. 4th. Statistics comparing the relative frequency of caries between the first and second molars prove the second molars more frequently carious than the first. 5th. The first molar, on the average, is a better constructed tooth than either the second or the third molar. 6th. Its extraction is the cause of more irregularity than is generally supposed. He said—"Irregular teeth do not straighten themselves simply because the first molars are extracted. Extraction of the first molars before the eruption of the second will many times shorten the bite, allowing the jaws to come closer together, the bicuspids not being allowed to erupt fully; the undue pressure on the upper anterior teeth causing their protrusion and the lower to come in contact with the gums above. Even when symmetrical extraction of the first molars has been performed, with the view of their replacement by the second molars, it happens more often than otherwise that the second molars tilt forward into the space, and not only form lodging places for food, but cause some serious malocclusion. * * * Distal occlusion of the lower arch on one or both sides; bicuspids tipped distally, second molars mesially; rotation of one or more teeth; elongation of the teeth; separation with unsightly spaces, are some of the effects of extraction of the first molars. The results of extraction in general upon the form, position and function of the teeth are so well known that we ought to hesitate a long time before we ruthlessly destroy the harmony of the mechanism of articulation and mastication by the unnecessary extraction of any tooth."

Dr. E. Forberg (Stockholm) (9), shows from an examination of the teeth of 18,000 school children in Sweden, that the percentage of caries in the second molar, at the age of fourteen to fifteen, is greater than that of the first molar at the age of seven to eight, clinical experience also showing that after the twelfth year the first molar is less susceptible to caries, while the susceptibility of the second molar increases very largely; hence it is irrational to practice the extraction of a first molar in order that the second molar, which is a weaker tooth, should take its position. Dr. Forberg discusses the various arguments advanced in favor of the removal of the first molar, and concludes that any gain in space is only temporary; that the occlusal curve of compensation is flattened, and the normal force of mastication reduced; while the backward development of the mandible does not occur. "Hence the extraction of the first molars not only reduces the force of mastication, but also disturbs the arrangement of the articulation and produces no favorable changes whatever."

At the April meeting of the New York Institute of Stomatology Dr. S. E. Davenport read a paper entitled "Stray Thoughts About Regulating." (10) He emphasized the importance of properly diagnosing each case, taking impressions and studying the casts, comparing with the patient's face before deciding upon the course to be pursued. He considered the desirability of avoiding extraction in nearly every instance. He said, "Without extraction we have, in the crowded arch, only to expand the arch and rearrange the teeth, while extraction makes the condition at once abnormal."

In a paper read before the Washtenaw County (Mich.) Dental Society (11), Dr. Milton T. Watson makes the claim that orthodontia is to-day as much a science as is the practice of surgery, one of the best evidences of this being the fact that both the normal and the pathological conditions of the parts involved are carefully considered, enabling the orthodontist to make a careful and accurate diagnosis and prognosis before beginning treatment, the facial requirements being as carefully considered as are the occlusal demands. Dr. Watson prophesies that the day will come when the study of fine art will occupy a prominent place in the dental curriculum. He says, "The artist or the sculptor would be an utter failure without a well developed sense of balance and harmony, and what applies so forcibly to a man who chisels a marble face has a vastly greater

importance for the man who is molding the face of a human being through the immense possibilities in orthodontia."

[References—(1) Dental Clippings, Jan., '02, p. 45. (2) American Medicine, Feb. 15, '02 (from Items of Interest, June, 422). (3) International Dental Journal, June, '02, p. 393, 421. (4) Dental Cosmos, Oct., '01, p. 1227. (5) Dental Cosmos, March, '02, p. 286. (6) Western Dental Journal, July, '02, p. 292. (7) Dental Summary, March, '02, p. 155 (from Cosmos), 866. (8) Dominion Dental Journal, April, '02, p. 129. (9) L'Odontologie, April 15, '02 (from Cosmos, June), 645. (10) International Dental Journal, June, '02, p. 447. (11) Pacific Dental Gazette, May, '02, p. 308 (from Register).]

The report of the Committee on Oral Hygiene in Public Schools was presented, and on motion was referred to the Auditing Committee.

Report of the Committee on Oral Hygiene.

MR. PRESIDENT AND MEMBERS OF THE N. D. A.:—As Secretary of your Committee on Oral Hygiene in our Public Schools I beg to submit the following report on the work done during the past year. A widespread interest in the subject of oral hygiene appears to have been awakened, and the plan outlined by your Committee, which received your endorsement at the last annual meeting, and which has been followed again during the past year, has met with general approval, the demand for diagrams for the examination of the teeth of school children having been very large. As was the case last year, however, the work of the Committee has been delayed and hampered for lack of funds, the requisition on the treasury, authorized by resolution adopted last year, not having been approved by your President until the month of April of this year, by which time the public schools were already looking forward to the closing exercises, making it more difficult to obtain the necessary permit for the examinations from the school authorities than it would have been earlier in the session.

Your Committee has endeavored to have this subject brought to the attention of all the state societies throughout the country, ad-

dressing the officers of each society, as was done last year, as nearly as possible just previous to the date of the annual meeting of each society.

To those societies from which no reply was received last year the following circular letter was sent, addressed to the secretary:

"Dear Doctor:—It having been decided at the meeting of the N. D. A. in 1901 to continue the work of the committee on 'Oral Hygiene in our Public Schools' on the same lines as last year, and in the hands of the same committee, I am writing to again direct your attention to the circular letter on the reverse of this sheet, a copy of which was sent to the president and secretary of your society last year. No action appears to have been taken by your society, as no report has been received from you. The report of the committee upon the work accomplished last year may be found in the N. D. A. Transactions, 1901. May we not hope that your society will take up the matter this year, and aid the committee in the effort to secure a sufficiently large number of reports from different sections of the country to enable them to compute reliable averages? Please place the matter before your society at its coming meeting, and favor me with an early report."

To those societies not reached last year a similar letter was sent, but modified according to circumstances. Shortly after the date of each state society meeting a request was made for information as to action taken by the society.

It unfortunately happens that the annual meeting of the greater number of state societies takes place so late in the spring that even when favorable action has been taken by the society it is already too late to make the examinations in the public schools, which are at that time preparing for the final examinations and the school authorities are unwilling to allow the time for the examination of the teeth.

The following replies have been received from state societies—

(1) From *Alabama* Dr. J. P. Corley, chairman of the committee appointed by the state society, sent us in April the names of 26 Alabama dentists who were willing to make the examinations in 153 schools. A letter was immediately sent to each of these men giving the necessary information as to obtaining a permit from the school authorities, etc., the essential points being finally reduced to the following postal-card limit—

Dear Doctor:—Before sending diagrams we must (1) have definite assurance that permit for the oral examination has been granted by the school authorities; (2) we must know the number of schools; (3) we must know

the number of children under the age of fifteen enrolled in each school. Diagrams will be sent promptly on receipt of the above information.

Only three of the examiners have thus far reported the necessary permit obtained, and no returns have as yet been received from Alabama.

(2) A committee of five was appointed by the state society of *California,* to co-operate with the N. D. A. committee, but the latest report from the committee is to the effect that no meeting has been held.

(3) *Delaware* reported last year that no meeting of the state society had been held for three years. No reply has been received this year.

(4) The documents sent to the members of the committee appointed by the *Florida* State Society have not been heard from.

(5) In *Louisiana* the secretary of the state society, Dr. A. L. Plough, read an interesting paper on the work being done throughout the country along this line, and reported co-operation with the New Orleans Academy of Stomatology in the work of this committee.

(6) The state society of *Idaho* reported no action taken.

(7) *Illinois* also reported no action taken.

(8) Dr. Richard Grady, Chairman of this Committee, will report on the work done in *Maryland.* In June, 1896, a committee was appointed to formulate a plan of examination of the teeth of children in the public schools of Baltimore. November, 1900, the committee, believing that the time had arrived for the inauguration of the movement, recommended (and the Association adopted) these four resolutions: (1) That said committee take the proper steps to secure the inspection of the teeth and mouths of children in a limited number of public schools, say not less than five schools; (2) That said committee, if permission is secured, provide brief talks on the care of the teeth to the students of the City College and High Schools; (3) That said committee invite members of this association, friendly to its objects, to become their colleagues and accompany them to the School Board, and if possible induce the school commissioners to co-operate, after explaining to them the character and importance of the movement; (4) That each visiting dentist have assistants to aid in sterilizing instruments and in filling out examination blanks, who may be students from the graduating classes of the several

dental schools indorsed by the deans. May, 1902, the committee appeared before the school commissioners of Baltimore and asked permission to examine the mouths and teeth of pupils from six to fifteen years of age in not less than five schools located in different sections of the city, and also to give brief talks to the students of the City College and High Schools on the care of the mouth and teeth. The request was refused on these grounds briefly: "The method would make the public schools unpopular;" "the movement would not be tolerated by the Johns Hopkins' University and Woman's College, hence why should the poor because of his necessity, be subjected to anything he would resist were it in his power;" "by what authority does the School Board order such examination, other than that it would affect the health of the neighboring pupils by contagion or infection?" It is anticipated that favorable action will be taken by the school commissioners if a printed pamphlet or leaflet on oral hygiene for use in the public schools is submitted. The examination of the pupils' teeth is not considered expedient at this time.

(9) We have no report from *Massachusetts* later than August of last year, when a committee of five was appointed to report at the next annual meeting of the society, the committee to be appointed by the incoming president.

(10) The state society of *Maine* appointed a committee which printed and sent out to the dentists throughout the state an invitation to make the examinations, as the result of which ten of the leading dentists in the state responded, giving the number of children whose mouths they would examine. The requisite number of diagrams was promptly sent to each one, but thus far returns have been received from only two of the examiners.

(11) *Michigan.* Diagrams were sent in May to Dr. Hoff, Ann Arbor, but have not yet been returned. (See also section 35).

(12) Great interest has been manifested in the matter by the state society of *Mississippi,* the secretary of the committee having in course of preparation a book on Oral Hygiene for use in the public schools. Diagrams have been sent to a number of Examiners in different parts of the state and returns received from five.

(13) No acknowledgement has been made of the sample documents requested for the members of the *New York* State Society committee.

(14) In reply to request for report from the *Pennsylvania* State Society we received a copy of the Transcript for 1901, showing the appointment of a committee of five, with power to act in the matter of collecting the desired statistics, and also in the revision of the chapters in the school text-books pertaining to dentistry.

(15) The documents sent to the *Tennessee* State Society were misplaced and no action was taken.

(16) The *Texas* State Society obtained the promise last year of the appointment of a conference committee by the Medical Association, but no report has been received as to the result.

(17) A supply of diagrams was sent to the *Washington* State Society in October, but the filled blanks have not yet been returned, although a report was requested in time for the present meeting.

This completes the list of state societies, as far as heard from. Correspondence has also been instituted with 129 local societies, holding meetings monthly, semi-monthly or otherwise than annual. To those which were addressed last year, but from whom no report was received, the circular letter sent to the state societies was sent, and to other societies the same modification of the circular as to the state societies not reached last year. The following replies have been received:

(1) The San Francisco Dental Association in March requested sample diagrams, etc., and reported 60,000 public school children, with promise to communicate further as soon as final arrangements were made with the board of education. Result not yet learned.

(2) The Denver Dental Association "does not deem it advisable to attempt anything of the kind with the existing conditions in the schools." A committee was appointed to put out a pamphlet "under the auspices of the Association for the instruction of parents, the same to be distributed from reception rooms without any individual advertisement thereon."

(3) The District of Columbia Dental Society last year expressed a willingness to fill "any number of examination diagrams," but no reply has been received as to permit from school authorities.

(4) The Isaac Knapp Dental Coterie (Fort Wayne, Ind.) requested sample diagrams, etc., which were sent in January, but nothing further has been heard from the society.

(5) The Secretary of the Western Indiana Dental Society wrote

in December, promising to call the attention of the Society to the work of this Committee, having prepared a paper bearing on the subject. He has not been heard from again, though written to in April.

(6) The Cedar Rapids (Iowa) Society requested diagrams, and in January was seeking permit from the superintendent of schools.

(7) The Academy of Stomatology (New Orleans, La.) appointed a committee of five to confer with the board of instruction. They obtained a hearing and the matter was placed in the hands of the committee on primary schools. A conference with that committee secured a permit for the examinations to be made in the fall in one school in each of the seven city districts.

(8) The Harvard Odontological Society (Boston) appointed a committee on "General consideration of the matter of Oral Hygiene in Our Public Schools" to whom blanks were sent in January. In March the committee reported, "It is unlikely that examinations can be made in Boston before 1903" (for reasons given).

(9) The Detroit Dental Society in December requested "fuller details as to the object in hand" and a supply of samples, which were sent at once, but nothing further has been heard from the Society.

(10) The St. Joseph Odontological Society (Mo.) reported no action taken.

(11) The Southern New Jersey Dental Society reports, on the part of the board of education—"a strict rule against any outside interference."

(12) The Secretary of the Allegany County Dental Society (New York) wrote in January, promising to again bring the matter to the attention of the Society, no action having been taken last year, and to "work for its good." Not heard from since.

(13) The Syracuse Dental Society (New York) requested samples, which were sent but have not been heard from.

(14) No reply has been received from the Fort Wayne Dental Association, written to again in February.

(15) Samples were requested by and sent to the Toledo Dental Society. A committee was appointed by the Society to ascertain the number of school children within the age limit, and another committee to ascertain how many dentists would volunteer to make the examinations. The first committee reported 26,000 children, but no reply has been received as to conference with school authorities, etc.

(16) The Reading (Pa.) Dental Society reported to the Pennsylvania State Society an investigation of the public school textbooks, with a view to the elimination of erroneous statements on dental subjects. The suggestions offered by the committee were adopted by the state society, as reported.

(17) The First District Dental Society of New York appointed a committee to whom the necessary information, together with sample documents, was given in March, but nothing further has been heard from the Society.

(18) Sample diagrams were sent to the Galveston (Texas) Dental Society, which last year promised co-operation and examinations in the fall, but no report has been received.

(19) The Richmond (Va.) Dental Society wrote in April that consent of the school board had not been obtained to enter the schools, the trouble being the time taken from studies, but that further efforts would be made.

(20) The Tide-Water Dental Association (Va.) reported in April the appointment of a committee by whom efforts were being made to make arrangements with the school boards of the cities of Norfolk and Portsmouth.

(21) The Portland Stomatological Club (Oregon) reported in March the appointment of a committee to wait upon the school board, but the result has not been learned.

(22) No reply received from The Associated Dental Surgeons of Baltimore.

(23) Sample diagrams, etc., were on request sent to the Head-of-the-Lakes Dental Society (Minn.) in March, but nothing further has been heard from them.

(24) The same is the case with The Duluth-Superior Dental Society.

(25) We did not succeed in hearing from The Fraternal Dental Society (St. Louis) through the secretary, as per the address published in the DENTAL DIGEST, so tried through letters addressed to Dr. Whipple and Dr. Emma E. Chase, but no reply has been received.

(26) The Indianapolis Dental Club reports very little work done by the Club last winter, but hopes to renew work in the fall when the work of this Committee will be placed before the Club.

(27) The Brooklyn Dental Society is doing no active work at present, the membership being almost identical with that of the Second District Dental Society of New York which, through Dr. Hyatt, did such valuable work last year.

(28) A committee appointed by The Peoria Dental Society interviewed their superintendent of public schools very promptly (the day after being appointed) and secured the desired permit. Eight thousand diagrams were sent to the chairman of the committee in April. Results not yet reported.

(29) The Northern Ohio Dental Association reported action taken at the June meeting and sample matter was sent at once. No further report received.

(30) The Connecticut Odontological Society, to whom sample matter was sent last August, has made no reply to a recent request for a report for this meeting.

(31) At the May meeting of the Central Dental Association of Northern New Jersey Dr. Irwin, as the essayist of the meeting, read an essay on "The Public Dental Service" which was published in the Camden *Post-Telegraph,* a copy of which was sent to your Committee as the report from that society. Dr. Irwin reported 84 replies to 103 circular letters sent to county and city school superintendents, the large number of replies showing interest in the subject. Eleven city superintendents were opposed to the idea of dental service in the schools, while eight were decidedly in favor of it. Four out of five school teachers expressed themselves in favor of official dentists.

(32) Sample matter was on request sent to the Southwestern Michigan Dental Society in April, but no reply has been received to request for the necessary data.

(33) The Southern California Dental Association decided as an opening wedge to print a pamphlet for distribution to the school children, and 30,000 copies were distributed throughout Southern California.

(34) We failed to obtain the name of the secretary of the Washtenaw (Mich.) County Dental Society, receiving no reply from the president, Dr. Watling, to whom we wrote in February.

This includes the substance of the replies received to date to the

very large number of letters written since the last meeting of the Association.

(35) A letter, forwarded by Dr. Stiff of the committee, was received from Dr. Jesse Filmar of Buchanan, Mich., who proposed to visit a number of country schools, giving a short talk on the care of the teeth, and making the examination of the teeth where it could be arranged for. Sample diagrams, etc., with the necessary information, were sent to Dr. Filmar in May, as requested by Dr. Stiff, but no acknowledgement of receipt has been received.

(36) Dr. A. E. Mascort (Havana, Cuba) wrote in April for information as to the work of the committee. Dr. Mascort stated that he had read a paper before the International Sanitary Congress in February on "Dental Inspection in Public Schools," and was making an effort to induce the government to appoint dentists in the public schools of Havana.

In conclusion permit me to say that while the preliminary work thus far done by the Committee has served to awaken a widespread interest in the subject, as evidenced by the demand for sample diagrams, etc., the results from a statistical point of view are not satisfactory, and other methods must be devised, for which purpose a meeting of the Committee should be called at an early date.

With this report I beg also to tender my resignation as secretary of the Committee. Other duties make such imperative demands upon my time that it will be impossible for me to longer serve you in this capacity.

Attached you will find bill for expenses incurred for postage, expressage, printing, stenographer, mimeographing, tabulating, recording, filing, etc., including clerical assistance for 1901, for which no bill was rendered last year.

The filled-in diagrams returned to date, together with balance on hand of printed matter, diagrams, etc., are held subject to your order.

Respectfully submitted,

W. E. WALKER, *Secretary.*

On motion, consideration of the proposed new constitution and by-laws was made a special order of business for 12 o'clock.

On motion adjourned.

The 12 o'clock meeting was called to order by the Chairman.

The subject of the proposed new constitution and by-laws by Dr. Black was generally discussed. The text of this work was materially changed in places. Dr. Fillebrown offered the following, which was accepted: Voted that

Whereas, The proposed constitution proposes many changes with which the members of this Association are not familiar, and that the essential propositions can be in a large degree carried out under the authority of a resolution, it is voted

That action on the adoption of the proposed constitution be deferred for one year. Voted

That a Committee of three be appointed by the President to formulate a plan for next year's session as nearly in conformity with the proposed plan as is practicable.

Adjourned to meet at 4 p. m.

The Wednesday afternoon meeting was called to order by the Chairman at 4 o'clock.

Minutes of the previous meeting were read and approved.

The following standing resolution was presented by Dr. Thos. Fillebrown:

Resolved, That the Secretary of the Association and the Chairman of the Sections shall be a committee on program, and it shall be the duty of this committee to prepare and publish a program for each annual session of this Association, and mail a copy to each member at least one week before the commencement of the session.

On motion, the resolution was recommended for adoption.

An amendment to Section 1, Article XII, of the Constitution, to the effect that the annual sessions of the Association shall begin on the last Tuesday in July, was presented.

Section 1, according to proposed amendment will read as follows: The annual sessions of this Association shall begin on the last Tuesday of July of each year, unless otherwise determined by vote of the Association at the annual session. The sessions shall continue four days.

Dr. Wms. Donnally presented his report on Navy legislation. It was directed read before the main body.

Report of Committee on Army and Navy Dental Legislation.

TO THE OFFICERS AND MEMBERS OF THE NATIONAL DENTAL ASSOCIATION:—It has been the sincere purpose of your Committee on Army and Navy Dental Legislation to carry out in letter and spirit your instructions of the 1899 and 1901 meetings to the end.

First. That there may be secured to the officers, men and boys in the U. S. military service the benefits of the services of an educated, ethical, and efficient corps of dental surgeons. *Second.* That the value of dentistry to the general health, comfort, longevity and efficiency of the military man may be more universally recognized. *Third.* That the educational value of the dental college course, the importance of the function of the Doctor of Dental Surgery, and the civil status of the dental profession should be conceded as sufficient to entitle the military dental surgeon to equality with other professions in certain grades of rank, pay and allowances.

As has been fully explained heretofore, the status secured through the efforts of this Committee for the army dental surgeon was acceptable because he entered the service on the "terms and conditions" applicable to more than two-thirds of the medical officers of the Army, because the War Department had by regulations so adapted the contract system that the contract surgeon is at no social, professional or official disadvantage, and for the further important reason that the contract system adopted by Congress at the beginning of the Spanish War afforded the only available means to commissioned positions for either surgeons or dental surgeons. However, nothing else than commissioned rank for army officers can be altogether satisfactory to the professions they represent, or to the military service.

The contract system is foreign to the navy, and because of the peculiar conditions which obtain in the naval service cannot be so adapted as to fix definitely and satisfactorily the social, professional and official relations of a contract officer. The influence the profession may exert directing legislation intended to improve the status of officers already provided for by law is very much less potent than that which may be exerted in determining the status provided in the

original act. It is therefore important that the navy dental surgeon should have his commissioned status fixed by the terms of the *original* legislative act.

In accordance with these views a bill providing for a navy dental corps with three grades of commissioned rank was offered in the Senate January 8, and in April bills almost exactly similar in their provisions, relating to both the Army and the Navy, were offered in the Senate by Honorable Edmond W. Pettus of Alabama, and in the House by the Honorable Walter P. Brownlow of Tennessee and the Honorable Chas. F. Joy of Missouri. These bills were, as is the custom, referred to the Navy and the War Department respectively. The bills relating to the Army provide for the reorganizing of the contract corps on a commissioned basis, with ranks of the grades of Lieutenant, Captain and Major, and for such an increase as may be required, not exceeding one dental surgeon to one thousand in the military service. This bill received the approval of Surgeon General George M. Sternberg, in accordance with his purpose formed two and a half years ago, and at that time expressed to your committee.

The Secretary of War promptly and vigorously disapproved the commissioning of dental surgeons, for the alleged reason that their duties are in no sense military. In this connection we digress to mention that of the first two dentists sent to the Philippines with General Merritt's Army one was killed in battle soon after his arrival, and some of the contract dental surgeons are constantly exposed to the dangers of war and of the military service. There are members of both the Senate and the House Military Committees who will continue to favor commissioning dental surgeons notwithstanding the disapproval of the Secretary of War.

The Navy Department offered to the Naval Committee of the Senate in February a substitute bill ostensibly intended to place the navy dental surgeon on a par with the army dental surgeon, but the modifications proposed are unsatisfactory and inconsistent with the purpose stated. With the incoming of a new Secretary and a new Surgeon-General the bills offered in April were again referred to the Navy Department, but no formal report was made.

The whole subject of Army and Navy dental surgeon legislation presents but two essentially important aspects, namely, rank and the method of legislating. With reference to rank the Navy Depart-

ment's recommendations are unique, and quite contrary to the principles and policy advocated as essential to the standard of efficiency required of medical and other staff and line officers. It is not believed however, that the Department will further urge the recommendations or that Congress will adopt them.

On the advice of the Chairman of the Naval Committee of the Senate, your Committee pursued the policy of incorporating in the Naval Appropriation bill the substance of the naval dental surgeon bill. The Naval Committee of the House opposed this policy and successfully resisted the Senate's amendments to the Naval Appropriation bill which related to an increase in the medical and other Departments of the Navy. The failure of the Navy Department and the Naval Committees to fully consider and determine the matter of rank is the *first* cause, and the variance in the method of legislating with reference to the proposed increase in the personnel of the Navy is the *second* cause of our bill going over to the next session. We have the assurance of the House Committee that the bill will be taken up and determined on its merits early next session. The conditions seem favorable for obtaining the rank we ask for, but this cannot be assured. Adverse legislation may be more harmful than no legislation on the subject, though if there be no legislation the Navy Department will probably continue to secure the services of dentists who are willing to sacrifice their professional dignity, and ignore their professional interests by accepting the positions of yeomen or hospital men, with the agreement on the part of the Department that they will be detailed to render dental service.

In regard to the unauthorized employment of dentists by the Navy Department, and its harmful effect on the professional status of dentistry, we quote our representation to the authorities:

It is respectfully submitted for your consideration in connection with the matter of the status now accorded and to be hereafter accorded dental surgeons in the Naval Service, that the dental profession never sought legislation nor proposed a bill on the subject until some years after the Surgeon General of the Navy expressed his desire for a dental service, nor until the policy of the Department seemed to be indicated by Navy Medical Officers importuning dentists to accept undignified petty offices (the duties of which are not connected with dentistry), with the stated purpose of detailing them to do professional work. The proposed bill is a mild and most respectful protest against the Government, or a Department thereof in the absence of

legislative authority, giving a military status to a profession wholly inconsistent with its civil status and in no respect commensurate with the important character and value of the service demanded, nor with the standard of educational equipment fixed by the profession and measured up to by its educational institutions.

Such an attitude, whether legislative or executive, must necessarily degrade the high professional status of dental surgeons in this and other countries, affect harmfully the educational institutions, deter the better fitted young men of this and other countries from entering dentistry through the high standard schools, and otherwise lower the respect in which American dentists and American dental colleges are held throughout the civilized world.

Your Committee, aided by a number of the members of the dental profession, by a few dental colleges, and by several presidents of universities having dental departments, exhausted its resources to secure a determination of the matter of rank, and we now ask this National Association to invoke the aid of every dental organization, of every dental college, of every medical teacher connected with dental colleges, of every person of influence, with their respective representatives in Congress, and especially of every chancellor or president of a university having a dental department, in appealing to the House Naval Committee members, *before the next session of Congress,* to grant the Navy dental surgeon the commissioned rank provided by House bills 13968 and 13971.

Respectfully submitted,

M. F. FINLEY, *Chairman,*
WMS. DONNALLY, *Secretary,*
CHAS. S. BUTLER,
GORDON WHITE,
Committee.

Dr. Stainton spoke of report of Committee on President's Address, and presented the following as a substitute for the paragraph relative to the New York degree question:

Concerning the transfer of the M. D. S. for the D. D. S. degree in the state of New York, your Committee is of the opinion that National Dental Association should express itself very emphatically against any such proposed transfer, and that the Secretary be instructed to forward a copy of this resolution to the Secretary of the Regents.

The matter was generally discussed.

On motion, the substitute was directed placed in the main report.

On motion, the Secretary was instructed to transmit a copy of these resolutions to the Secretary of the Regents of New York.

The third resolution in connection with the proposed International Dental Congress was taken up for consideration, and was amended to read that a committee of fifteen be appointed, and that the President of the Association appoint said committee.

On motion, the resolution as amended was recommended for adoption.

The report of the Committee on History was read and, on motion, accepted.

Report of the Committee on History.

To the Executive Council:—The Committee on History desires to report that the work of collecting and verifying data is being carried on. We can assure the Association that it would not be a difficult matter to take up a large amount of valuable time in the consideration of this interesting subject, but, as it would probably be at the risk of interfering with the presentation of more practical matters, we refrain at this meeting from making more than "a report of progress."

During the past year we have been greatly encouraged by the interest taken in the work by several of our dental journals and by the dental societies. It was with the hope of extending this popular interest that we have considered the "biographical aspect" largely. We feel that when the average dentist realizes the character of many of the men who have made the profession what it is to-day he will more willingly take serious interest in the scientific and technical work that they have done.

It is with a feeling of sadness that we are again compelled to announce the death of a member of this Committee, Dr. Henry B. Noble of Washington, D. C., and of Dr. Benj. Lord of New York, an advisory member. We recommend that Drs. A. H. Fuller and Burton Lee Thorpe of St. Louis be added to this Committee.

CHARLES MCMANUS, *Chairman.*

Adjourned to meet at 9 o'clock Thursday morning.

Thursday morning meeting was called to order by the Chairman at 9 o'clock.

Minutes of previous meeting read and approved.

Dr. J. N. Crouse presented the accounts of the Protective Association, which were audited by Drs. J. Y. Crawford, M. F. Finley, and C. N. Peirce.

On motion, the Secretary was instructed to draw orders on the Treasurer for all bills accredited and presented by the Auditing Committee.

The accounts of the Protective Association were reported correct and financial condition splendid.

The Treasurer's report was read and accepted.

Treasurer's Report.

RECEIPTS FOR 1901.

Balance on hand, Aug. 6, 1901	$1,033.51	
Collection since (114-136)	2,080.17	
		$3,113.68

DISBURSEMENTS.

Prosecuting Fraudulent Colleges	$ 500.00	
Army and Navy Bill	500.00	
Salary Secretary, 1900	400.00	
Expenses Secretary's Office, 1900	160.61	
Hall Rent Milwaukee	150.00	
Official Stenographer	135.00	
Salary Treasurer for 1900	100.00	
J H. Worman's R. R. Expense	78.15	
Printing and Mailing Transactions 1900	75.62	
Committee Public Hygiene	37.00	
Expenses Treasurer's Office	28.35	
Stationery Army and Navy Committee	11.00	
Section No. 6	9.45	
Section —— V. H. J.	8.00	
Cablegram	6.51	
Section No. 2	5.25	
History Committee	5.00	
		$2,271.79
Balance		$841.89

Respectfully submitted,

HENRY W. MORGAN, *Treasurer.*

Examined and approved.

Auditing Committee { V. H. JACKSON, T. S. WATERS, CHARLES MCMANUS.

Report of Section III was read and accepted.

Report by Dr. Finley, Secretary of Section II, was read and accepted and directed read before main body.

Report of Secretary of Section II.

Dental Education.—There are at present fifty-two dental schools or colleges in America which are members of the National Association of Dental Faculties. Fifty-one of these are in the United States and one is in the Dominion of Canada. Fewer schools are coming into existence each year on account of the increasing entrance requirements and added number of terms. This is a matter for congratulation, for it not only tends to check undesirable competition, but also improves the quality of those in existence. The wisdom of increasing the entrance requirements is shown in the better educated class of men applying for admission; in the character of work done while they are in college, and by the increasingly higher averages made by them before the various state boards after graduation. The addition of a fourth year to the college curriculum, which takes effect with the session of 1903-4, will undoubtedly still further improve the character of the material turned out from the colleges, especially in the way of practical or manipulative skill acquired during a longer course.

Dental Literature.—In the matter of standard professional literature the past year has been quite prolific. Many new text-books of instruction have issued from the press, some of them of decided merit.

"Anesthetics and their Administration," by Frederic W. Hewitt, M. A., M. D., of London, 3rd edition, is a work suitable alike for the student and the practitioner. The treatment of the subject is comprehensive and yet concise, while the arrangement of the matter is orderly and admirable.

"Studies of the Internal Anatomy of the Face," by M. H. Cryer, M. D., D. D. S., is a collection of former contributions upon the subject, with much new and valuable matter added. It is a work for the practitioner or special student of anatomy rather than for the average dental student. The author advances no theories, but presents incontrovertible facts by a wealth of half-tone reproductions from photographs of original sections and dissections.

"The Manual of Chemistry, a Hand-book for Students of Medicine, Pharmacy and Dentistry," by W. Simon, Ph. D., M. D., is a standard work which has reached its seventh edition. The whole subject of physiological chemistry is covered in a full, yet not diffuse manner, while the clearness of detail gives it added interest to the dental student as a text-book.

A book on "Oral Surgery" has just been prepared by H. H. Grant, M. D., proof sheets of which have been advanced to your Committee. The work appears to be valuable, but it can be more critically gone over and examined after it has been issued from the press.

"Principles and Practice of Operative Dentistry," by John S. Marshall, M. D., has been prepared for the benefit of both practitioners and students. In the treatment of the subject the author follows very closely the plan of the "Text-book of Operative Dentistry," which was published some years ago and which has been very generally adopted as a text-book by the dental schools in this country. Including very little new matter, its presentation of the old is happily done, and the work will prove especially valuable to practitioners as a book of reference.

Of new editions of former publications we have to mention "A Practical Manual of Bacteriology for Students and Physicians," by A. C. Abbott, M. D., 6th edition. "Irregularities of the Teeth and Their Treatment," by E. S. Talbot, M. D., D. D. S., 4th edition. "Anatomy, Descriptive and Surgical," by Henry Gray, F. R. S., 15th edition. "Dental Medicine," by F. J. S. Gorgas, A. M., M. D., 7th edition. "Questions and Answers," by Dr. F. J. S. Gorgas.

There has also been published a work on "Orthodontia," by J. N. MacDowell, D. D. S. It consists of a restatement of the work of others in this same line, together with Angle's basis of classification slightly modified, with but little new matter.

Periodical Literature.—During the year the number of dental journals published in this country has not been materially increased or diminished, but those in existence have with few exceptions improved in the character and quality of the articles. They were formerly divided into two rather well defined groups—one devoted to the publication of scientific articles, and the other to the promulgation of articles and notes of a technic or practical character. The distinction between the two seems to be disappearing through each

taking over to itself some of the formerly distinctive features of the other. The change promises to be of advantage to both.

The section has received and passed upon one paper, "Some Thoughts on the So-called Preliminary Requirements," by Andrew J. Flanagan. The paper by Geo. W. Cook, "Some Constitutional Factors in Local Infection," was considered and referred to Section IV as more properly belonging to that Section.

M. F. FINLEY, *Secretary.*

The Auditing Committee made the following report, which was concurred in:

To the Executive Council of the National Dental Association:

Your Auditing Committee have examined and approved all accounts of the Association that have been presented to date.

V. H. JACKSON,
T. S. WATERS,
CHAS. MCMANUS.

July 31, 1902.

To the Executive Council of the National Dental Association.

Your committee on credentials respectfully report that they have examined and approved the credentials presented by delegates representing the following societies and colleges:

Alabama Dental Association—Dr. W. E. Proctor, Sheffield.

California State Dental Association—Dr. Henry P. Carlton, San Francisco.

Chicago Dental Society—Dr. A. C. Hewett, Dr. W. T. Reeves.

Colorado State Dental Association—Dr. A. L. Whitney, Denver.

Connecticut State Dental Association—Dr. A. C. Fones, Bridgeport; Dr. E. S. Gaylord, New Haven; Dr. E. B. Griffith, Bridgeport; Chas. McManus, Hartford; James McManus, Hartford; C. W. Strang, Bridgeport.

District of Columbia Dental Society—Dr. S. W. Boles, Washington; Dr. E. A. Bryant, Washington; Dr. Sheldon G. Davis, Washington; Dr. H. P. Davis, Washington; Dr. W. E. Dieffenderfer, Washington; Dr. Williams Donnally, Washington; Dr. Paul Evans, Washington; Dr. John H. Hess, Washington; Dr. W. D. Munroe, Washington; Dr. J. Roland Walton, Washington; Dr. Geo. B. Welch, Washington.

Harvard Dental Alumni Association—Dr. W. E. Boardman, Boston, Mass.; Dr. Fred P. Brown, Haverhill, Mass.; Dr. Thos. Fillebrown, Boston, Mass.; Dr. Chas. E. Parkhurst, Somerville, Mass.; Dr. Charles E. Perkins, Brocton, Mass.

Illinois State Dental Society—Dr. Chas. E. Bentley, Chicago; Dr. G. V. Black, Chicago; Dr. H. J. Goslee, Chicago; Dr. A. H. Peck, Chicago;

Dr. Geo. B. Perry, Chicago; Dr. E. A. Royce, Chicago.

Indiana State Dental Association—Dr. W. W. Shryock, Indianapolis.

Iowa State Dental Society—Dr. Frank T. Breene, Iowa City; Dr. C. W. Bruner, Toledo,; Dr. A. W. Dana, Burlington; Dr. W. A. Heckard, Indianapolis, Ind.; Dr. R. W. Rule Pella; C. L. Topliff, Decorah.

Kansas State Dental Association—Dr. George A. Esterly, Lawrence; Dr. W. H. Hayden, Youngstown, O.; Dr. A. H. Thompson, Topeka.

Kentucky State Dental Association—Dr. Wm. Diedrich, Louisville; Dr. C. W. McGuiar, Munfordville; Dr. E. D. Rose, Bowling Green.

Lynn Dental Society—Dr. M. C. Smith, Lynn, Mass.

Maryland Dental Association—Dr. C. M. Gingrich, Baltimore.

Massachusetts Dental Society—Dr. D. Hurlbut Allis, Springfield; Dr. Waldo E. Boardman, Boston; Dr. W. I. Brigham, So. Framingham; Dr. F. P. Brown, Haverhill; Dr. Thos. Fillebrown, Boston; Dr. Andrew J. Flanagan, Springfield; Dr. Chas. E. Parkhurst, Somerville; Dr. Chas. E. Perkins, Brockton; Dr. George E. Savage, Worcester.

Michigan Dental Association—Dr. M. P. Green, Chicago.

Missouri State Dental Association—Dr. Henri Letord, Kansas City.

Nebraska State Dental Association—Dr. W. Clyde Davis, Lincoln; Dr. W. R. Smith, Pawnee City.

New Jersey State Dental Society—Dr. J. S. Voegtlen, Newark.

New York Institute of Stomatology—Dr. E. A. Bogue, New York City; Dr. C. O. Kimball, New York City.

New York State Dental Society—Dr. Henry D. Hatch, New York City; Dr. B. S. Hert, Rochester; Dr. H. N. Holmes, Canandaigua; Dr. F. W. Proseus, Rochester.

North Carolina State Dental Society—Dr. J. A. Gorman, Rocky Mount; Dr. S. P. Hilliard, Rocky Mount.

Northeastern Dental Association—Dr. W. E. Boardman, Boston; Dr. Thos. Fillebrown, Boston; Dr. E. S. Gaylord, New Haven, Conn.; Dr. Geo. E. Savage, Worcester, Mass.

Northern Ohio Dental Association—Dr. Varney E. Barnes, Cleveland, O.; Dr. W. G. Ebersole, Cleveland, O.; Dr. Ira W. Brown, Cleveland, O.

Nova Scotia Dental Association—Dr. Frank Woodbury, Halifax.

Ohio State Dental Society—Dr. H. C. Brown, Columbus; Dr. E. M. Cook, Toledo; G. S. Junkerman, Cincinnati; Dr. David Stern, Cincinnati.

Oklahoma Dental Association—Dr. R. H. Pendleton, Norman City.

Oregon State Dental Association—Dr. Norris R. Cox, Portland.

Pennsylvania State Dental Society—Dr. C. B. Bratt, Allegheny; Dr. M. H. Cryer, Philadelphia; Dr. G. W. Cochran, Erie; Dr. S. P. Cameron, Philadelphia; Dr. Wm. F. Fickes, Pittsburg; Dr. James P. Nichols, Philadelphia; Dr. A. W. Orr, West Newton; Dr. G. C. Robb, Altoona; Dr. M. I. Schamberg, Philadelphia; R. H. D. Swing, West Philadelphia.

St. Louis Dental Society—Dr. D. O. M. LeCron, St. Louis; Dr. M. C. Marshall, St. Louis.

Tennessee State Dental Association—Dr. Henry W. Morgan, Nashville; Dr. W. F. Buckner, Winchester.

Wisconsin State Dental Society—Dr. C. C. Chittenden, Madison; Dr. James T. Stuart, Milwaukee; Dr. F. G. Van Stratum, Hurley; Dr. W. C. Wendel, Milwaukee.

Respectfully submitted,
V. H. JACKSON,
T. S. WATERS,
CHAS. MCMANUS.

Orders were ordered drawn for salary of the Secretary and Treasurer, same as last year.

Minutes of the present meeting were read and approved.

On motion, Council adjourned.

A. H. PECK, *Recording Secretary.*

APPENDIX

EX-PRESIDENTS OF THE AMERICAN DENTAL ASSOCIATION.

1859*	W. W. ALLPORT	Chicago, Ill.
1860	W. H. ATKINSON	Cleveland, Ohio.
1861	No meeting.	
1862	GEORGE WATT	Xenia, Ohio.
1863	W. H. ALLEN	New York, N. Y.
1864	J. H. MCQUILLEN	Philadelphia, Pa.
1865	C. W. SPALDING	St. Louis, Mo.
1866	C. P. FITCH	New York, N. Y.
1867	A. LAWRENCE	Lowell, Mass.
1868	JONATHAN TAFT	Cincinnati, Ohio.
1869†	HOMER JUDD	St. Louis, Mo.
1870	W. H. MORGAN	Nashville, Tenn.
1871	GEO. H. CUSHING	Chicago, Ill.
1872	P. G. C. HUNT	Indianapolis, Ind.
1873	T. L. BUCKINGHAM	Philadelphia, Pa.
1874	M. S. DEAN	Chicago, Ill.
1875	A. L. NORTHROP	New York, N. Y.
1876	GEO. W. KEELY	Oxford, Ohio.
1877	F. H. REHWINKEL	Chillicothe, Ohio.
1878	H. J. MCKELLOPS	St. Louis, Mo.
1879	L. D. SHEPARD	Boston, Mass.
1880	C. N. PEIRCE	Philadelphia, Pa.
1881	H. A. SMITH	Cincinnati, Ohio.
1882	W. H. GODDARD	Louisville, Ky.
1883	E. T. DARBY	Philadelphia, Pa.
1884	J. N. CROUSE	Chicago, Ill.
1885	W. C. BARRETT	Buffalo, N. Y.
1886	W. W. ALLPORT	Chicago, Ill.
1887	FRANK ABBOTT	New York, N. Y.
1888	C. R. BUTLER	Cleveland, Ohio.
1889	M. W. FOSTER	Baltimore, Md.
1890	A. W. HARLAN	Chicago, Ill.
1891	W. W. WALKER	New York, N. Y.
1892	J. D. PATTERSON	Kansas City, Mo.
1893	Formal session only, owing to the holding of the World's Columbian Dental Congress; officers elected in 1892 held over until 1894.	
1894	J. Y. CRAWFORD	Nashville, Tenn.
1895	J. Y. CRAWFORD	Nashville, Tenn.
1896	JAS. TRUMAN	Philadelphia, Pa.

*First meeting, for organization.

†Owing to a change in the Constitution, officers elected at this and the sessions following served at the next annual meeting subsequent to their election.

EX-PRESIDENTS OF THE SOUTHERN DENTAL ASSOCIATION.

1869*	W. T. ARRINGTON	Memphis, Tenn.
1870	W. T. ARRINGTON	Memphis, Tenn.
1871	JAS. S. KNAPP	New Orleans, La.
1872	F. Y. CLARK	Savannah, Ga.
1873	H. M. GRANT	Abingdon, Va.
1874	ROBT. ARTHUR	Baltimore, Md.
1875	J. R. WALKER	New Orleans, La.
1876	W. T. ARRINGTON	Memphis, Tenn.
1877	W. G. REDMOND	Louisville, Ky.
1878	S. J. COBB	Nashville, Tenn.
1879	F. J. S. GORGAS	Baltimore, Md.
1880	J. B. PATRICK	Charleston, S. C.
1881	V. E. TURNER	Raleigh, N. C.
1882	E. S. CHISHOLM	Atlanta, Ga.
1883	L. D. CARPENTER	Atlanta, Ga.
1884	H. J. MCKELLOPS	St. Louis, Mo.
1885	A. O. RAWLS	Lexington, Ky.
1886	W. C. WARDLAW	Augusta, Ga.
1887	W. W. H. THACKSTON	Farmville, Va.
1888	B. H. CATCHING	Atlanta, Ga.
1889	J. Y. CRAWFORD	Nashville, Tenn.
1890	JOHN C. STOREY	Dallas, Tex.
1891	G. F. S. WRIGHT	Georgetown, S. C.
1892	GORDON WHITE	Nashville, Tenn.
1893	B. HOLLY SMITH	Baltimore, Md.
1894	Same officers hold over.	
1895	H. E. BEACH	Clarksville, Tenn.
1896	JOHN S. THOMPSON	Atlanta, Ga.
1897	W. H. RICHARDS	Knoxville, Tenn.
1898†	E. P. BEADLES	Danville, Va.

*First meeting, for organization; Jas. S. Knapp, Chairman *pro tem.*

†First President of the Southern Dental Association as a branch of the National Dental Association, organized August, 1897, by the consolidation of the American Dental Association and the Southern Dental Association.

LIST OF OFFICERS.

PRESIDENT—L. G. Noel, 527½ Church St., Nashville, Tenn.

VICE-PRESIDENT—South—S. W. Foster, 63 Inman Building, Atlanta, Ga.

VICE-PRESIDENT—West—C. C. Chittenden, 21 W. Main St., Madison, Wis.

VICE-PRESIDENT—East—Charles McManus, 80 Pratt St., Hartford, Conn.

CORRESPONDING SECRETARY—W. D. Tracey, 46 W. Thirty-seventh St., New York, N. Y.

RECORDING SECRETARY—A. H. Peck, 92 State St., Chicago, Ill.

TREASURER—Henry W. Morgan, 211 N. High St., Nashville, Tenn.

EXECUTIVE COMMITTEE.

J. D. Patterson, *Chairman*.....Keith and Perry Building, Kansas City, Mo.

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J. D. Patterson (*1905).....Keith and Perry Building, Kansas City, Mo.
C. N. Johnson (*1903).....Marshall Field Building, Chicago, Ill.
H. A. Smith (*1905).....116 Garfield Place, Cincinnati, O.

SECOND DIVISION—COMMITTEE ON CREDENTIALS AND AUDITING.

V. H. Jackson (*1903).....240 Lenox Ave., New York, N. Y.
T. S. Waters (*1905).....756 Eutaw St., Baltimore, Md.
W. N. Cogan (*1904).....1746 "M" St., N. W., Washington, D. C.

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C. S. Butler (*1904).....680 Main St., Buffalo, N. Y.
G. V. I. Brown (*1904).....Empire Building, Milwaukee, Wis.
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(*Term expires.)

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W. E. Walker, *Secretary*.....Box 52, Pass Christian, Miss.

SECTION II—DENTAL EDUCATION, LITERATURE, NOMENCLATURE, HISTOLOGY AND MICROSCOPY.

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James McManus.....80 Pratt St., Hartford, Conn.

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A. R. Melendy.....Knoxville, Tenn.

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R. H. Hofheinz.....138 E. Main St., Rochester, N. Y.
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SECTION IV. Physiology, Etiology, Hygiene, Prophylaxis and Electricity.

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SECTION V. Anatomy, Pathology and Surgery.

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*BEACH, JNO. R.....Clarksville, Tenn.
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KNAPP, J. S.....New Orleans, La.
LOWRANCE, H. A.....Athens, Ga.
MCDONALD, R. H.....Griffin, Ga.
MARSHALL, E. B.....Medical Bldg., Rome, Ga.
RAMBO, SAMUEL.....Montgomery, Ala.
TIGNER, J. A.....Rome, Ga.

New Members Elected at 1902 Meeting.

BARNES, VARNEY E.....Cleveland, Ohio.
BENTLEY, CHAS. E.....Chicago.
BOWLES, S. W.....Washington, D. C.
BRATT, C. B.....Allegheny, Pa.
BREENE, FRANK T.....Iowa City, Iowa.
BRIGHAM, W. I.....South Farmington, Mass.
BROWN, FRED P.....Haverhill, Mass.
BROWN, H. C.....Columbus, Ohio.
BROWN, IRA W.....Cleveland, Ohio.
BRUNER, C. W.....Toledo, Ohio.
BRYANT, EMORY A.....Washington, D. C.
BUCKNER, W. F.....Winchester, Tenn.
CAMERON, S. P.....Philadelphia, Pa.
CARLTON, HARRY P.....San Francisco, Cal.

COOK, EVERETT M.....Toledo, Ohio.
COX, MORRIS R.....Portland, Ore.
DANA, A. W.....Burlington, Iowa.
DAVIS, H. PORTER.....Washington, D. C.
DAVIS, S. G.....Washington, D. C.
DIEFFENDERFER, W. F.....Washington, D. C.
DIETRICH, WILLIAM.....Louisville, Ky.
EBERSOLE, W. G.....Cleveland, Ohio.
ESTERLY, GEO. A.....Lawrence, Kan.
EVANS, PAUL W.....Washington, D. C.
FICKES, W. L.....Pittsburg, Pa.
GINGRICH, C. M.....Baltimore, Md.
GREEN, M. P.....Chicago.
GRIFFITH, E. B.....Bridgeport, Conn.
HATCH, HENRY D.....New York City.
HAYDEN, W. H.....Youngstown, Ohio.
HECKARD, W. A.....Indianapolis, Ind.
HERT, B. S.....Rochester, N. Y.
HESS, JNO. H.....West Point, N. Y.
HEWETT, A. C.....Chicago.
HILLIARD, S. P.....Rocky Mount, N. C.
HOLMES, H. N.....Canandaigua, N. Y.
LECRON, D. O. M.....St. Louis, Mo.
LETORD, HENRI.....Kansas City, Mo.
MARSHALL, M. C.....St. Louis, Mo.
MEGUIAR, C. W.....Munfordville, Ky.
MONROE, WILLIAM D.....Washington, D. C.
NICHOLS, JAMES P.....Philadelphia, Pa.
ORR, A. W.....West Newton, Pa.
PENDLETON, R. H.....Norman, O. T.
PERKINS, CHAS. E.....Brockton, Mass.
PERRY, GEO. B.....Chicago.
PROCTOR, W. E.....Sheffield, Ala.
PROSEUS, F. W.....Rochester, N. Y.
REEVES, W. T.....Chicago.
ROBB, G. C.....Altoona, Pa.
ROSE, E. D.....Bowling Green, Ky.
ROYCE, A. E.....Chicago.
RULE, R. W.....Pella, Iowa.
SCHAMBERG, M. I.....Philadelphia, Pa.
SMITH, W. R.....Pawnee City, Neb.
STERN, DAVID.....Cincinnati, Ohio.
STRANG, CLINTON W.....Bridgeport, Conn.
SWING, R. H. D.....West Philadelphia, Pa.
TOPLIFF, C. L.....Decorah, Iowa.
VAN STRATUM, F. G.....Hurley, Wis.
VOEGTLEN, J. S.....Newark, N. J.

WALTON, J. R.....Washington, D. C.
WELCH, GEO. B.....Washington, D. C.
WHITNEY, A. L.....Denver, Colo.
WOODBURY, FRANK.....Halifax, Nova Scotia.

States Represented by Membership in Good Standing, March 1, 1903.

Pennsylvania	41	Virginia	6
Illinois	39	Kentucky	5
New York	38	Nebraska	5
Ohio	21	Maryland	5
District of Columbia	19	Texas	5
Massachusetts	16	Minnesota	4
Missouri	16	Indiana	4
Georgia	15	Michigan	4
Tennessee	15	Canada	4
New Jersey	13	Colorado	3
North Carolina	13	Oregon	3
Connecticut	12	Kansas	2
Wisconsin	11	Arkansas	1
Alabama	10	France	1
Iowa	9	Nova Scotia	1
California	8	Oklahoma Territory	1
South Carolina	8		
Mississippi	6	Total	364

Constitution of the National Dental Association.

ADOPTED AT OLD POINT COMFORT, AUGUST 5, 1897.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the Science of Dentistry, and have adopted the following Constitution and Rules of Order for our government:

CONSTITUTION.

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them a mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

SECTION 1. The members of this Association shall of three classes, viz., permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

SECTION 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

SECTION 3. All members shall be practitioners of dentistry. They shall be received only from permanently organized dental societies. They shall be elected by ballot at some regular meeting of their society, and shall be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

SECTION 4. Honorary members shall consist of prominent, worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

SECTION 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belong, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

SECTION 1. Any permanently organized dental society may send one for every six of its active members, as delegates to this Association for one year, upon complying with the requirements of its Constitution; but no society shall be entitled to representation that does not accept or substantially recognize the Code of Ethics of this Association.

SECTION 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SECTION 3. If the Committee on Credentials has knowledge that any applicants for membership are violating the Code of Ethics, said applicants shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SECTION 4. This Association will receive no delegates who, since August, 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment.

DUES.

SECTION 2. The annual dues in this Association shall be five dollars.

DUES—TO BE PAID.

SECTION 3. No member is eligible to office, nor can he speak or vote in this Association, or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SECTION 4. If the dues of any member remain unpaid for two years his name shall be erased from the list of members of this Association.

CONDUCT OF MEMBERS.

SECTION 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained, to report to the Executive Council at the next meeting of the annual session at which the charges are preferred. Whereupon, by a vote of the council the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SECTION 6. Any member of this Association being expelled or suspended from his local society, shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SECTION 7. Any member not in arrears may offer his resignation, upon the acceptance of which by the council, his membership shall cease; but the Council may at any time thereafter reinstate such member by unanimous consent.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and an Executive Committee consisting of nine members.

EXECUTIVE COUNCIL.

SEC. 2. The President, Secretary, and five members to be elected annually by the Association shall constitute an Executive Council, and shall be governed by the same rules of order as the Association.

TERM OF OFFICE.

SEC. 3. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

ELECTION OF OFFICERS.

SEC. 4. The President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and members of the Executive Council and

Executive Committee shall be elected by ballot in open session of the Association. Three members of the Executive Committee shall be chosen from each division.

SEC. 5. Commencing with 1898 the President shall be chosen from the division in which the meeting is to be held.

SEC. 6. One of the Vice-Presidents shall be chosen from each division,—namely, one from the East, one from the West, and one from the South.

SEC. 7. The candidates for President and Vice-Presidents shall be nominated by an informal ballot of the Association. The three names, or in case of a tie, the four names, having the greatest number of votes, shall be the sole nominees.

A formal ballot shall then be taken, in which a majority of the ballots cast shall be necessary to a choice.

The informal ballot may be made formal by a three-fourths vote of the members present.

ARTICLE VII—DUTIES OF OFFICERS.

DUTIES OF PRESIDENT.

SECTION 1. The President shall preside according to parliamentary usage as laid down in "Robert's Rules of Order" and the Rules of Order adopted by this Association, and shall present an annual address.

DUTIES OF VICE-PRESIDENTS.

SEC. 2. In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in the absence of these officers a Chairman *pro tem.* shall be appointed by the Executive Council.

DUTIES OF CORRESPONDING SECRETARY.

SEC. 3. The Corresponding Secretary shall attend to the correspondence of the Association with the societies therein represented, and with other scientific bodies as may be desirable, and shall report to the Executive Council.

DUTIES OF RECORDING SECRETARY.

SEC. 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be *ex-officio* chairman of the Publication Committee, and shall see that due notice is given of the time and place of the sessions of the Association.

DUTIES OF TREASURER.

SEC. 5. The Treasurer shall hold all the moneys belonging to the Association and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the session of the Executive Committee at 8 a. m. on the day of the annual meeting to receive dues, and shall attend at roll-call

to verify the list of names, checking all such as are in arrears for dues; he shall restore such names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigined by the President, and shall report to the Executive Committee, where his accounts shall be audited and by whom his report shall be presented to the Executive Council, together with their own.

SEC. 6. All resolutions appropriating money, except for the legitimate expenses of this Association, shall require a two-thirds vote of all the members of the Association present at a regular meeting.

EXECUTIVE COUNCIL.

SEC. 7. The Executive Council shall meet at 10 o'clock on the day of the first meeting of each annual session, and afterward by adjournment, or at the call of the presiding officers for the reception of the reports of officers and committees, and for the transaction of other business of the Association.

SEC. 8. All matters not otherwise specially provided for shall be referred to the Executive Council without debate.

SEC. 9. The Executive Council shall report to the Association at each session the results of their proceedings for ratification or rejection without debate.

SEC. 10. The President and Secretary of the Association shall hold the same position in the Executive Council as in the Association.

SEC. 11. Four members of the Council shall constitute a quorum for the transaction of business.

SEC. 12. All meetings of the Council shall be public, the time and the place for which shall be posted for information of the members. Members may be heard on any matter before the Council.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall be the business committee of the Association. They shall report to the Executive Council at each session, under the proper head, their doings for the current year.

CLASSIFICATION OF EXECUTIVE COMMITTEE.

SEC. 2. At the first election of the Executive Committee, the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward one new member shall be elected each year by separate ballot, from each division, to serve three years, and in case of the absence of any member of this committee his place may be temporarily filled by the remaining members of the committees.

SUBDIVISION OF EXECUTIVE COMMITTEE.

SEC. 3. The Executive Committee shall meet after the election of new

members to choose their own chairman and secretary, and to divide themselves into three sub-committees as follows, and for the purposes described.

FIRST DIVISION—COMMITTEE ON ARRANGEMENTS.

SEC. 4. The first division of this committee shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, of which they shall have the charge. They shall provide a book for the registration of members or visitors as they arrive, with the place of their residence and hotel address, and shall attend to the general wants of the Association during its session. It shall be their further duty to secure from the Treasurer a good and sufficient bond.

SECOND DIVISION—CREDENTIALS AND AUDITING COMMITTEE.

SEC. 5. The second division shall examine and verify the credentials and qualifications of members, including all violations of the Code of Ethics and the Constitution, and shall also be the Auditing Committee for that year.

THIRD DIVISION—COMMITTEE ON VOLUNTEER ESSAYS.

SEC. 6. The third division shall examine all volunteer essays before they are read to the Association, and such as they approve they shall refer to the proper Section.

They shall report names of places for the next session of the Association.

REPORTS OF SUB-COMMITTEES.

SEC. 7. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report, if possible; but in case of their inability to decide upon any matter, it shall be brought before the Executive Council for its decision.

MEETINGS OF EXECUTIVE COMMITTEE.

SEC. 8. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association, and shall meet for the examination of credentials and the reception of papers, and such other business as may properly come before them, at 8 A. M. on the first day of the annual session.

CHAIRMAN MAY CONVENE THE COMMITTEE.

SEC. 9. The Chairman of the Executive Committee may at his own discretion summon the members thereof to a meeting at any suitable hour during the sessions of the Association, and at any other time at the request of five members of the committee.

ARTICLE IX.

LOCAL COMMITTEE OF ARRANGEMENT.

SECTION 1. There shall be appointed by the President, annually, a committee of three, residing at or near the place selected for the next meeting,

whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be needed for the Association.

PUBLICATION COMMITTEE—HOW APPOINTED.

SEC. 2. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The Committee shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SEC. 3. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Executive Council may direct, or the committee judge to be of sufficient value. They shall specify in the annual report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand.

SEC. 4. Any report or other paper, to be entitled to publication in the volume of the Transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee within twenty days after the close of the annual session, and must also be so prepared that the proof sheets furnished the authors shall be returned to the committee without material alteration or addition.

SEC. 5. Every paper received by this Association, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published for its benefit.

DISCLAIMER.

SEC. 6. The Publication Committee is hereby instructed to print at the beginning of each volume of the transactions the following disclaimer, viz.: "The National Dental Association, although formally accepting and publishing the reports of the various sections, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE X.

QUORUM.

Fifteen members shall constitute a quorum in this Association.

ARTICLE XI.

SUSPENSION OF RULES—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XII.

TIME AND PLACE OF MEETINGS.

SECTION 1. The regular sessions of this Association shall commence annually at 11 A. M. on the first Tuesday after the last Saturday in August, or at such time as shall be determined by vote of the Association at the annual session.

SEC. 2. The place for holding the next annual session shall be determined each year by ballot of the Association at its annual session, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter, in the order named, meeting in each section every third year.

SEC. 3. For the purposes of this Association, the United States shall be divided into three divisions, to be called The East, The South, and The West.

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, lower peninsula of Michigan and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, West Virginia, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico and Alaska.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

SECTION 1. This Association shall be divided into six Sections, as follows:

1. Prosthetic Dentistry, including Crown- and Bridge-Work, Metallurgy, Chemistry, Orthodontia.
2. Dental Education, Literature, Nomenclature, Histology, Microscopy.
3. Operative Dentistry, Materia Medica, and Therapeutics.
4. Physiology, Etiology, Hygiene, Prophylaxis and Electricity.
5. Anatomy, Pathology, and Surgery.
6. Clinics.

SEC. 2. It shall be the duty of each member to identify himself with one or more of the above-named sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association.

SEC. 3. The Secretary shall assign members to the Sections in which they are expected to work if they shall fail to make their own choice before the close of the morning meeting of the second day of the session.

SEC. 4. It shall be the duty of the Recording Secretary, immediately at

the close of the morning meeting of the second day, to present lists of the names of each Section, as a basis for the organization of the Sections.

SEC. 5. The members of each Section shall choose a Chairman and Secretary, and they shall be members known to be capable, and interested in the performance of the duties of the offices.

SEC. 6. The Chairman of each Section shall preside at all of its meetings; shall exercise general supervision over the business, and shall see that the labors of his Section are conducted in the manner calculated to secure the best results. The Chairman, and such other member or members as the Section shall select, shall prepare and read at the annual session of the Association next ensuing, a paper or papers on the advances and discoveries of the past year in the branches included in the Section. The reading of such papers shall not together occupy more than forty minutes.

SEC. 7. The several Sections shall meet at 9:30 A. M. on the morning of the first day of the annual session of the Association.

SEC. 8. For the information of all members, a list of the members of each Section shall be published in the Transactions of each year.

SEC. 9. The reports of the Sections shall be called by the President in consecutive order, beginning each succeeding year one number higher than on the preceding year, and no Section having been called and passed shall be again heard until all others have been called.

ARTICLE XIV.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SECTION 2. Branches shall have such powers and privileges, and be subjected to such obligations, as shall be determined upon from time to time by the National Association in annual session.

GOVERNMENT.

SECTION 3. Each Branch shall be free to hold meetings and to govern itself as its members shall think fit, but no Branch law shall be valid which, in the opinion of the National Association, may contravene any fundamental law of the Association.

EXPENSES.

SECTION 4. Each Branch shall pay its own expenses, and no Branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

PROCEEDINGS.

SECTION 5. Each Branch shall furnish a copy of its proceedings, includ-

ing papers and discussions, for publication with the transactions of the National Association.

DELEGATES.

SECTION 6. Each Branch may receive delegates from societies within its division upon the same conditions as the National Association, and such delegates shall have the same standing in the National Association as though admitted directly from the state societies.

DUES.

SECTION 7. The annual dues of members attending the Branches shall be paid to the Branch Treasurer. Three-fifths of the dues may be retained for the benefit of the Branch. The remaining two-fifths shall be paid over to the Treasurer of the National Association.

SECTION 8. The annual session of any Branch shall be omitted whenever the annual session of the National Association shall be held in its division.

RULES OF ORDER.

1. On the arrival of the hour of meeting the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. No one shall be permitted to address the Association before giving his name and residence, which shall be distinctly announced from the chair; nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

4. At the request of any member a motion shall be put in writing.

5. At the request of five members a question shall be divided, or the yeas and nays ordered.

6. When a question is under debate no other motion shall be in order, except—1st, to adjourn; 2d, to lay on the table; 3d, the previous question; 4th, to postpone; 5th, to commit; 6th, to amend—and these motions shall take precedence in the order here stated.

7. The previous question, and the motions to adjourn, to lay on the table, and to postpone, shall be decided without debate.

8. A motion to adjourn shall always be in order, but no member can make such a motion while another is speaking or while a vote or ballot is being taken.

9. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

10. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Association.

11. No member shall interrupt another while speaking, except to raise a point of order.

12. When called to order, a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Association. If the point of order be sustained, the member can proceed in order by the consent of the Association.

13. Every member shall vote upon a question unless excused by the Association.

14. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

15. Any member who on a question voted in the majority may move a reconsideration of that question; but if that motion shall be lost or laid upon the table, it shall not be renewed without unanimous consent.

16. The President may vote with the members upon all questions, but having so voted, shall not give the casting vote in case of a tie.

17. Motions for filling blanks shall be put in the order in which they are moved.

18. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

19. These rules may be suspended by unanimous consent.

ORDER OF BUSINESS.

8 A. M.—Meeting of Executive Committee for filling vacancies.
9 A. M.—Meeting of Executive Council.
9:30 A. M.—Meeting of Sections.
11 A. M.—Meeting of the Association.
President's Address.
Report of Sections and discussions.
Report of Executive Council.
Ballot for place of next annual session.
Election of Officers.
Installation of Officers.
Appointment of Committees.
Reading of minutes.
Adjournment.

AMENDMENTS.

The Constitution, Rules of Order, and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. *Resolved,* That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. *Resolved,* That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. *Resolved,* That it is unprofessional to use on cards or signs anything except name, title, and address.

4. *Resolved,* That this Association now in session direct that Sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics or to give other exhibitions before this body.

5. *Resolved,* That a Standing Committee of three be appointed, to be known as the Committee on Termology, whose duty it shall be to prepare and submit a carefully prepared report at each annual meeting of this Association.

6. *Resolved,* That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

7. *Resolved,* That a committee of three be appointed by the chair to cooperate with the officers in charge of the Army Medical Museum and Library in enriching its store of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

8. *Resolved,* That the National Dental Association condemns the use of secret preparations known as *"local anesthetics,"* as well as all other secret preparations.

9. *Resolved,* That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects of the paper read before them and digests of the same, and to send said reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the Chairman of the Section to which they belong.

10. *Resolved,* That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

11. *Resolved,* That lists of the ex-presidents of the American Dental Association and of the Southern Dental Association shall be published annually

in the Transactions of the National Dental Association, and that all members and officers hold the same relations to the National Dental Association that they did to the former associations.

CODE OF ETHICS.

ARTICLE I.—THE DUTIES OF THE PROFESSION TO THEIR PATIENTS.

SECTION 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are in most cases unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to operations performed on living, sensitive tissue.

SEC. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficient efforts of our profession. He should encourage no false hopes by promising success when, in the nature of the case, there is uncertainty.

SEC. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

ARTICLE II.—MAINTAINING PROFESSIONAL CHARACTER.

SECTION 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid everything in language and conduct calculated to dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged, special encouragement to their juniors.

SEC. 2. It is unprofessional to resort to public advertisements, cards, handbills, posters, or signs, calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners; to publish reports of cases or certificates in the public prints; to circulate or recommend nostrums; or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by cards, simply their names, occupation, and place of business, or, in the same manner, to announce their removal, absence from, or return to business, or to issue to

their patients appointment cards having a fee bill for professional services thereon.

SEC. 3. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

SEC. 4. When general rules shall have been adopted by members of the profession practicing in the same localities in relation to fees, it is unprofessional and dishonorable to depart from those rules, except when variation of circumstances requires it. And it is ever to be regarded as unprofessional to warrant operations as an inducement to patronage.

ARTICLE III.—CONSULTATIONS.

Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and broader views in practice.

In consultations that courtesy and just dealing which is the right of all should be especially observed.

ARTICLE IV.—THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS.

Dental surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and adjacent parts. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the broader knowledge of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty.

ARTICLE V.—THE MUTUAL DUTIES OF THE PROFESSION AND THE PUBLIC.

Dentists are frequent witnesses, and, at the same time, the best judges of the impositions perpetrated by quacks, and it is their duty to enlighten and warn the public in regard to them. For this and many other benefits conferred by the competent and honorable dentists, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity against the empiric and impostor. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way without proper remuneration.

NATIONAL DENTAL ASSOCIATION

SOUTHERN BRANCH

MEETING OF 1902

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NATIONAL DENTAL ASSOCIATION.

SOUTHERN BRANCH.

The fifth annual meeting of the Southern Branch of the National Dental Association was held in the Kimball House ballroom, Atlanta, Ga., April 18, 19, 20 and 21, 1902, Dr. H. H. Johnson, Macon, Ga., presiding.

The first session was called to order by the president at 10 o'clock Tuesday morning. The session was opened with prayer by Rev. Dr. J. Orme Flynn of Atlanta.

Mayor Livingston Mims, on behalf of the city, gave the association a very cordial welcome to the city, and in appropriate words, characterized by his usual wit and eloquence, turned the keys of the city over to the association.

Dr. J. A. Chapple, on behalf of the Atlanta members, delivered an address of welcome to the society, as follows:

Mr. President and Gentlemen of the Southern Branch of the National Dental Association:—To visit the metropolis of the state and be accorded its freedom and hospitality through her Chesterfieldian representative, is an honor quite sufficient to the native Georgian. But, to emphasize (if such a thing be possible) the cordiality of his greeting, in behalf of my confreres I assume the task most willingly.

If it be true that the average man reaches the zenith of his chosen career at the age of thirty-three, is it not equally true of organizations? Believing in the affirmative of this proposition, we hail your presence at this time as most significant and auspicious.

Since 1869, when we made our modest advent into the world, down to this good hour, busy brains and deft fingers have elaborated so much of genuine intrinsic value as will justly characterize the period

the most illustrious in our history. We shall not dispute the claim that this is pre-eminently the "Electrical" and the "Woman's Age," but we shall also insist that they share the honors equally with the "Dental Age."

Should the demand be made for the "rhyme or reason" of this claim, we would briefly cite the marvelous increase of our *standard* literature—the larger portion of which has made its appearance within the last fifteen years.

Educational facilities have kept pace with, if, indeed, they have not exceeded, her literature; and for every *one* institution of learning that was in existence thirty-three years ago, there are now *eleven*.

While there is very little to offer in way of tangible results in the domain of bacteriological research, yet there is quite enough to give a scientific flavor to our calling, and more than enough to stagger and confound the young novitiate who seeks admission to our ranks.

In further substantiation of our claim, in the absence of definite data on the subject, it is reasonably safe to assume that the universal revival of interest in pyorrhea alveolaris, has wrought the salvation of thousands and thousands of teeth, which, thirty-three years ago, would have been doomed to annihilation. To contemplate for a moment what this means as a contribution to general hygienic conditions and consequent longevity, forces the honest conviction that this one feature alone in our progress entitles us to no small recognition.

Before an impartial jury we might confidently rest our pleadings here. But remembering the proverbial "last word" of a possible contestant, to "make assurance double sure," we pass rapidly on to march in review other living witnesses to our claim.

From the purely artistic and inventive standpoint, the last thirty-three years have been most prolific, giving us the engine, the mallets, the dam and the separator, porcelain and gold crowns, inlays and bridge-work.

As a fitting acknowledgment of this almost incomparable achievement, the national government has but recently invoked our aid in the national service; and in the felicitations of the hour, there is at this moment in process of crystallization an international sentiment which will inevitably culminate in a universal recognition of the American diploma.

Thus you will observe that in these thirty-three years of toil and

battle for supremacy, *much* has been done to fascinate the historian and to wellnigh startle the statistician; and while our *own* personality may not appear very luminous in this record of achievement, yet, there is infinite consolation in the conscious reflection that we have not stood in the way of material progress or unselfish ambition; but, on the contrary, have ever been found supporting the leadership of those who would lead the way "Ad Astra per Aspera."

Reflecting upon the significance of your reunion at this time and place, for in this city of Atlanta, thirty-three years ago, the S. D. A. was organized, impelled a brief and imperfect summary of what had been done since your organization. What is more appropriate, therefore, than that you should return to the old home-stead, and once again around her altar recount the vicissitudes of the past and gather renewed energy and inspiration for the future.

To properly commemorate these events in our history, and to further your humanitarian purpose and lofty mission, it is needless to assure you of our hearty sympathy, cordial co-operation and joyous welcome. Those of you who have borne the brunt of the contest, we thrice welcome; those from the far North, the far East and the far West, shall be made to feel the sincerity of our heart's best impulses, and they, too, are thrice welcome.

Dr. J. Y. Crawford of Nashville, Tenn., responded to the above addresses, on behalf of the Southern Branch of the National Dental Association, in his own inimitable style.

Next order of business was roll call by Dr. C. L. Alexander, Charlotte, N. C., Corresponding Secretary.

Dr. S. W. Foster, Atlanta, Ga., Recording Secretary, read the minutes of the last meeting, and same were approved by the Association.

The Executive Committee having no report to make, the next order of business was the President's Annual Address. On motion of Dr. J. P. Gray, of Nashville, the President's Address was deferred until the afternoon session, on account of the late hour, and the regular order of business was continued.

Committee No. 8—Chemistry, Metallurgy and Anatomy—was called, and Dr. J. P. Gray, as Chairman, said that Committee was not ready to report, and asked for extension of time, which was granted.

Committee No. 9—Pathology, Materia Medica and Therapeutics—

through Chairman, Dr. Geo. S. Vann, Gadsden, Ala., also asked for extension of time, which was granted.

Dr. S. W. Foster, Chairman of Committee on Publication, laid before the Association a proposition from the Cosmos, to pay half the Reporter's salary, provided they would allow the Cosmos a copy of the report, and allow them the use of the same in the journal. After considerable discussion, the motion to accept this proposition was carried.

Meeting was then adjourned to meet at 2 o'clock in the afternoon.

FIRST DAY—AFTERNOON SESSION.

Meeting called to order at 2:30 o'clock by the President.

The minutes of last session read by Secretary and approved.

Dr. V. E. Turner, Chairman of the Executive Committee, reported that the Committee approved the program of exercises as published, subject to change by motion of the Society. The following names were submitted for membership: Dr. J. S. Betts, Greensboro, N. C.; Dr. J. M. Fleming, Raleigh, N. C.; Dr. John P. Carlyle, Greenville, N. C.; Dr. Wms. Donnally, Washington, D. C.; Dr. M. F. Finley, Washington, D. C.; Dr. D. M. Hall, Alabama; Dr. E. N. Passmore, Alabama.

Dr. L. G. Noel, of Nashville, First Vice-President, took the chair, and the President read his Annual Address, as follows:

ANNUAL ADDRESS, SOUTHERN BRANCH NATIONAL DENTAL ASSOCIATION.

H. H. JOHNSON, D. D. S., PRESIDENT, MACON, GA., 1902.

Gentlemen of the Southern Branch, National Dental Association:—Another year of full historic interest to our country, our profession and the world has rolled around and we have by a kind Providence once again been permitted to assemble in annual session. It is with a feeling of justifiable pride, mingled with pleasure, that I have had

conferred upon me the honor and privilege of greeting you on this, the fifth annual assembling of this association as your presiding officer. For this honor, I again take this opportunity to thank you. It is gratifying to see a large and representative attendance and in addition to the words of welcome which have already been spoken, I am glad also to welcome you to this thriving Southern city. Historically this city is of more than ordinary importance to us. It was here, thirty-three years ago, that a small band of self-sacrificing professional men, realizing the advantages to be gained by organized effort, gathered together to arrange plans for the creation of a Southern Society, of which this is virtually a continuation, changed in name—not in character—but with its sphere of practical usefulness and influence greatly extended.

When the idea was first promulgated to establish a great National organization, of which all sections might feel a just pride, through a combination of the Southern and American Associations, the possibility of the existence of Branches created at that time, was a most estimable feature, as has been demonstrated by the continued success of this, the experimental one. It is of the utmost importance to the continued general welfare of this Association and of the National Association, to which this holds allegiance, that the most cordial and friendly relationship should always be maintained between the two. It is also equally as important that the same cordial relationship and even a stronger bond of union, if found feasible, should be established between this and the State and Local Societies in this jurisdiction, that the far-reaching benefits of organization in its highest state of perfection may be procurable.

The State Societies would then be feeders to the Branch and the Branch, likewise, a feeder to the Supreme body. Until the form of organization which was *begun* at Old Point Comfort, in August, 1897, by the union of the American and Southern, shall extend to and take in the State Societies, the profession cannot be said to be thoroughly, systematically and practically organized.

In all well organized orders and societies there must always be a supreme body to which the local bodies shall hold allegiance. We can never hope to experience the grandeur of such an era of progressive prosperity until our present organization shall have taken upon itself some such indefectible form, and these suggestions have

hereby been made that the minds of the thoughtful, who have the welfare of the profession at heart, may possibly be turned in this direction.

There is need of a great National Organization composed of a somewhat select membership and it is the duty of every member of the dental profession in the United States, that laying aside all prejudice and selfishness to heartily and sincerely support any movement or method, even at some sacrifice, which has for its object the advancement of any such noble cause.

No one doubts the fact that it was through organization we have reached our present high state of advancement, and it is through the same medium that we must plant our hope of the future. Knowing by the past, our only guide, that the future welfare of our profession must depend largely upon association work, it behooves us to be ever in search of means and methods by which the membership may be increased and the bonds of union strengthened in these organizations, both State and National, for upon one depends the other. It is a discouraging, if not an alarming fact, which has been repeatedly stressed in presidential addresses and discussed in societies, that the membership in our associations is not increasing in proportion to the rapid growth numerically of the profession.

At the last meeting of the Georgia Society it was discovered that the membership was exactly the same as it had been fifteen years before, although the number of registered dentists in the State had more than doubled itself. (It may be said to the credit of this society, however, that they added forty new members at that session.) What is true of Georgia in regard to the increase of membership, is also true of most of the other States, and it is likewise true as regards this Association. This membership is supposed to be derived from nineteen states and it has increased only at the rate of about eight per year, not quite one-half of a member for each state, entirely out of proportion to the natural general increase in the profession. It is appalling that so many men exhibit absolutely no spirit of professional progress and that so few show any desire to assist in building and maintaining the profession. There are many professors in dental colleges who do not hold membership in either the National or Southern Branch, and Boards of Examiners in most states are very poorly represented. This is not as it should

be. Men who are fortunate enough to be considered qualified to hold these high and honorable positions, should at least set an example worthy and in keeping with their official stations.

The delegated membership also seems to grow less each year, or at least not to increase, due probably to a careless indifference on the part of officers of state societies. While no remedy suggests itself at this time for our general betterment in regard to a radical increase of membership, I desire to make the suggestion, looking to a gradual improvement in this line, that a committee might be created, to be known as the Committee on State Societies, whose duty it shall be to keep in mind the time of meeting and in touch by correspondence or otherwise, with the officers of state societies in this jurisdiction.

About the time of meeting, if not convenient to attend in person, then by correspondence to call attention to and urge the election of delegates to this body and when possible to secure a condensed report of the work done at the meeting, which should consist of very short abstracts of the papers read, together with the names and addresses of the authors, these abstracts to be condensed and shaped into the form of a report which should be presented to this Association at its next meeting thereafter. Without any recommendation this is presented for your consideration.

Professional History.

As we look back through the dim vista of the past and see comparatively nothing there substantially recorded of the many noble efforts and prodigious sacrifices made for the advancement of science by the pioneer workers in our profession, and as we stop to consider the great satisfaction daily derived from our well equipped modern offices, to say nothing of the enjoyment we get from the many other contributions to our science through their toiling, it ought at least to impress us with the importance, if not the justice, of a history of our profession.

Not only noble hearted pioneers, but notable men of all periods have spent both time and money in search of hidden truths, and we to-day selfishly enjoy the fruits of their efforts without so much as troubling to record the fact that they lived and delved, that mankind

might be benefited. This is extreme ungratefulness and we must not rest satisfied to allow such to be credited to us by posterity.

An effort has been repeatedly made in the National Association to accomplish this end and there is now in existence a strong committee from that association trying to collect data for such a work.

In order that we may do our duty and co-operate with this committee in a substantial way and at the same time insure a creditable representation for our section of the country, a committee was appointed at the last meeting of this association to write a historical sketch of the Southern Dental Association and this Association as a continuation of the Southern and submit a report at this meeting.

Army Medical Museum.

If we would impress the world with our growing importance we should be constantly on the alert that no favorable opportunity should escape us.

One of these opportunities has been presented through the dental section of the Medical Museum at Washington. In the dental offices of this country there are enough valuable specimens and models of pathological cases, which, if contributed, would make one of the most impressive collections in the world. Why not send them there, where they may be seen by the traveling public that they may become enlightened on the possibilities of dentistry?

Asylum Appointments.

Now that the Army Bill has been passed and our labors on that line finished for the present, why not take up the humane work of securing the appointment of dentists on the staff of physicians in each state lunatic asylum? Georgia has had one for over two years and it is a grand work for the relief of the suffering among this unfortunate class. In asking for appointments we will probably be confronted with the information that there is not a manifest need of a regular appointment as the necessary service is always obtained by calling in a dentist occasionally when such service is required. We should not allow such argument as this to divert us from our object, as there is at all times an urgent need of such service, both as a relief of suffering and as an adjunct to the medical staff in the treatment of nervous diseases, and it is a crying shame on our

Christian civilization that it is not provided in every such institution of blighted and unfortunate people in the land. The situation and our importance demands such appointments and the amount of service needed requires it.

Insurance Examinations.

A knowledge, alone, of the fact that the condition of the oral cavity plays a very important part in longevity, would naturally seem to demand that insurance companies should pay more attention to this important matter in the future than in the past. A report of a committee will probably be submitted at this meeting, giving an account of the work done on this line since our last session. We should not cease to urge the question until we have gained the recognition we desire.

Code of Ethics.

I would call attention to, either a seeming lack of knowledge of, or a growing disregard of the rules governing our code of ethics. The liberality of the code certainly permits of every member obeying its every edict without the least detriment to his professional success or personal welfare and cannot possibly amount to more than the golden rule, "therefore, all things whatsoever ye would that men should do to you, do ye even so to them." Certainly we should be willing to do that.

Those sections governing office signs, giving flattering testimonials to secret preparations and our demeanor towards patients of brother practitioners, seem to be those most frequently violated. Regarding the latter we can never exercise too much prudence and care. It is so easy and tempting to allow ourselves led on by a patient who has some imaginary cause for a pique at a brother practitioner, to say something which had best not be said at all. We sometimes yield to the temptation to criticise work which does not just come up to our standard of perfection, when we know absolutely nothing of the circumstances and difficulties which attended its making. Always remember before speaking that you have often done things yourself which could have been severely criticised. Let us be careful of our speech and ever remember to do unto others as you would that they should do unto you.

New Members.

While it is our desire and purpose to pursue as liberal policy as possible in regard to the acquisition of members, we cannot be too careful to properly investigate the professional home standing of the applicant. Holding membership in a state or local society renders one eligible to be elected a delegate to this body, and likewise opens the door to permanent membership here and in the National Association. Therefore, before accepting and passing upon credentials from any applicant it would be well if the Executive Committee would take into consideration the fact that the membership in some local societies may have in it those who are not regular graduates of reputable dental colleges, as is required by the Constitution of this and the National Associations, and therefore should be ineligible for election as delegates. They should be careful to make a searching enquiry into the manner these credentials were obtained and also whether the applicant is otherwise worthy to hold membership in this body, that no mistakes may ever occur. It is not creditable to this Association to give professionally unworthy persons the opportunity of boasting of membership here whose manner of conducting themselves professionally or otherwise is questionable at home.

Changes in the Constitution.

Article 3, Section 3, of the Constitution regarding delegate members does not seem to be sufficiently comprehensive to prevent the clashing of opinions. I would, therefore, recommend that its wording be changed and be made more explicit, or the Association interpret its correct meaning. The last two lines of the section seems to be the confusing paragraph, wherein it says, "but no person shall be received as a delegate who is in arrears for dues to this Association." In the strength of this closing paragraph the delegate members were last year required to pay five dollars for dues before being allowed the privileges of the floor. It is my opinion that it was never intended that delegate members should be required to pay dues, except where they expressed a desire to become permanent members. A delegate membership is simply an honorary membership for that year only, the object of which was to increase the attendance and incidentally to enlarge the permanent membership. It is my opinion that the Association should without delay pass upon this point.

I would also recommend that Article 8, Section 6, of the Constitution be changed. As it now stands the President elect nas not the privilege of naming the Chairman of the Clinic Committee, and without considering the injustice done this officer, it is practically impossible to judge two years in advance who the chairman should be to accomplish the best results. On account of the impracticability of the rule each President has been compelled to ignore the requirement and an inoperative law had best be repealed.

Standing Resolutions and Rules.

I would recommend that the Committee on publication be required to compile from the minutes, all new rules and resolutions passed by this Association for its better government during the last five years, and that they be published each year as an appendix to that portion of the Constitution and by-laws which are annually published with the minutes and annual proceedings. It is almost an impossibility for the affairs of the Association to be properly conducted without having a knowledge of these rules and resolutions, and they should be annually placed where they would be accessible to those interested.

Manner of Electing Officers.

I would recommend that this Association adopt the same rule in regard to the election of the higher officers, as is now in force in the National Association, believing that to be the best and most certain means by which the choice of the majority of the members present may be obtained.

An Account of Our Stewardship.

On account of the supposed necessary change in the time of holding the last meeting, it necessarily made the division of time between this and the Nashville meeting entirely out of proportion, giving eighteen months for the last and only six months for organizing and making preparations for this. In this short time your officers have labored with a sincere devotion to the duties imposed, and with what success the reports of the various committees will soon make you acquainted. I wish especially to commend the work of Dr. J. J. Sarrazin, Chairman Committee on Operative Dentistry. It is a pleasure to work with one so faithful, punctual and systematic. His

efforts have been crowned with success as his superb report will later show. On account of a very sad bereavement which it was the misfortune to befall the excellent Chairman of the Clinic Committee, Dr. H. R. Jewett, and in which we one and all deeply sympathize, it became necessary to ask that admirable worker, Dr. T. P. Hinman to practically take his place as Acting Chairman. Many of the splendid clinics which it will be your good fortune to witness at the proper time, were procured by his tireless efforts. I cannot refrain from making mention of that excellent gentleman and ceaseless worker, the Chairman of the Committee on Oral Hygiene, Dr. R. K. Luckie. All the Committeemen have worked earnestly and faithfully and each deserves special praise, but time and space will forbid.

Soon after the close of the Nashville meeting and after my stationery had been printed, my attention was called, by our worthy Treasurer, Dr. B. D. Brabson, to an error in the election of officers, whereby Dr. W. K. Slater was elected a member of the Executive Committee for three years, when he did not hold membership in this association. As there was no occasion for immediate action in the case, and as Dr. Slater has paid dues and given his promise to make application at this meeting for membership, I preferred to let the matter rest as it was for the time being and I now leave it with you to take such action as you may deem wise. In the efforts to organize this meeting the same difficulties were encountered which so often confront presidents of associations, viz., the great difficulty of obtaining answers to letters which should demand an immediate reply. Working up material for a meeting is tiresome and tedious at best, and exceedingly discouraging in the face of cold indifference. Let us each resolve to do better for our next President.

With the willing and faithful assistance of our efficient Corresponding Secretary, Dr. C. L. Alexander, every reasonable effort was made to secure a full delegated attendance, but the various duties came so fast upon us it was almost impossible to keep in proper touch with all sections of the country. If the Association should see fit to adopt the recommendation in another part of this address to appoint a Committee on State and Local Societies, it would greatly facilitate this important branch of the work. Our worthy President of last year saw a need of more efficient work on this line and recommended that the Corresponding Secretary be required to perform this extra

duty, but with due regard for his opinion, I think it would be an imposition and should be performed by a special Committee.

UNDESIRABLE ATTENDANCE.

The doors of our Association will always stand open and a hearty welcome will always await all reputable and decent practitioners of either medicine or dentistry. To all such we gladly extend an earnest right hand of fellowship and bid them come, mingle with us and be one of us, and in what I am about to say I hope I may be rightly understood. It is becoming noticeable each year that a certain class of objectionable characters who are ineligible for membership on account of the degrading commercial manner in which they conduct practice, have the brazen effrontery to infest our meetings with their presence. On clinic days they are especially numerous, and their brass noses may be seen in front of every clinician, while others may see as best they can. There is nothing in common between that class and the members of this Association or our eligible invited guests. They are opposed to codes of ethics, to societies, to professionalism and to all high and noble sentiments. They have never contributed a dollar, a sentiment or a thought to the advancement of dentistry or to any other progressive science. Their every act, word and thought has been to retard advancement, pull down and degrade. Then why are we in any way bound by liberality, sociality or otherwise to allow such arch enemies of our profession to infest our meetings with their obnoxious presence? It is true we must maintain at any inconvenience, the spirit of liberality, nothing selfish, nothing secret, but are we to allow this audacious imposition by such scabs and blots simply because they have the cheek and the determination to push themselves into respectable company uninvited, and after obtaining all the benefits procurable, the next day in public prints and by private conversation in public places, proclaim to the people, "that associations are their worst enemies, are trusts and combines whose only object is to keep up high prices and commit robbery." Under the existing circumstances it would seem that we have the right and should exercise the privilege of ridding ourselves of such intruders even though it became necessary to point out to them an opening in the wall through which they might retire.

THANKFULNESS.

We must not forget to return thanks to a kind Providence that our number has not been decreased since last we assembled, by any dreaded visitation from the scythe of time and extend a hope that it may meet His approval that the same manifold blessings may extend through another year.

PROGRESS AND FUTURE.

Looking back at the unexampled progress made in the last few years, I wish to say generally, and from which we may derive satisfaction as well as consolation, that we who have lived and labored in this time and age have, upon the whole, not ill performed our duty. But while it is our privilege to take consolation from this thought, let us be careful that we do not become too well satisfied with ourselves and our surroundings. We must push onward in the future as in the past, there must be no retrogression. Let us continue to work in the fields of science and having obtained knowledge, let no unworthy prejudices or selfishness induce us to withhold from any part of our professional brethren that which is justly their due. As you have received, freely give of the knowledge which you are fortunate enough to have in your possession. "A man is a man only as he makes life and nature happier for others." Therefore, let us never cease to delve in nature's laboratories, in search of truth that we may be better fitted to help others who may be in need of assistance, ever remembering that it is "more blessed to give than to receive," and "to wear out than to rust out." In our work at this meeting let no differences or contentions arise to retard progress unless perhaps it be "that noble contention or rather emulation as to who can best work and best agree." Let no previous convictions or prejudices against any system or any man, prevent you from examining into every subject brought before you, with impartial eyes and an unbiased mind, that the light of truth and knowledge, which is power, may find free ingress into your higher being which may be instrumental in guiding you in your future investigations.

With these convictions sunk deep into your minds, I feel persuaded that you will push forward with increased zeal and that the result of the deliberations of the next few days will mark an epoch in the

history of our profession and a new mile stone will be set up on the road of progress.

I now heartily invite you to allow your minds to freely partake of the many wholesome fruits which the labors of our efficient Committeemen have gathered together for your benefit.

On motion of Dr. Foster, the following Committee was appointed to make subsequent report on the President's Address: Drs. A. R. Melindy, Chmn., Geo. S. Vann, and J. Hall Moore.

The Committee on Chemistry, Metallurgy and Anatomy being called Dr. J. P. Gray, Chmn., made the following report:

Dr. Gray:—I am sorry that I have no formal report to make. I wrote to the President that possibly I would have a paper on Anatomy as applied to Prosthesis, but did not want it to go in the program. He has placed it in the program, and I have no paper. I am sorry that this Society was imposed upon by being promised a paper under this head and then not have one. Dr. Chace was to have prepared a paper on Chemistry, but the President asked him to write one on Operative Dentistry, as they were scarce on that subject, so the President is to blame for you not having any paper from this Committee. Doubtless, I would have had one, had the President not put it in the program.

Possibly the Committee will have some report to make before the session closes.

Committee on Operative Dentistry was called, and Dr. J. J. Sarrazin, New Orleans, Chmn., reported several papers to be read, and also a good many excerpts from the Dental Journals, which being very long, and having several papers from this Committee, he suggested that they be read by title, and motion was carried to this effect. The excerpts are as follows:

Excerpts from Articles in Operative Dentistry and collateral subjects prepared from some of the 1901 Dental Journals and presented by some members of the Committee on Operative Dentistry of the S. B. N. D. A.:

Excerpts from the Dental Review and from the International Dental Journal are from the pen of Dr. J. E. Chace of Ocala, Florida, as follows:

The Dental Review for Jan., reports a paper by J. Milton Walls, D. M. D., on "Enamel Cleavage Relative to Preparation of Cavities," in which an important point is brought out on the preparation of gingival enamel margins. The principle laid down is that the enamel bevel should be great, in proportion to the extension of the margin rootwards. The reason for this is clearly seen on a study of the Micro-photographic pictures of the enamel prisms in situ, with which this article is illustrated, the angle made by the prisms with dentine increasing as the root is approached.

Dr. A. W. Harlan is reported in the Dental Review for Jan. as announcing before the Chicago Dental Society the success awarded his experiments with Papain as a pulp digester. He recommends one grain of papain, one drop pure glycerol and one drop of 1-300 Hcl. to form a paste, which is applied to a dead pulp and sealed with cement. He advises washing cavity with acidulated water after the devitalizing application is removed, then sealing in the paste, allowing the same to remain two or three weeks, when the pulp may be removed as a jelly-like mass.

The Dental Review for Feb. publishes a paper read before the Minn. State Dental Society by H. L. Cruttenden in which he presents a new appliance in the way of a cement syringe to be used for filling roots with cement or chloro percha and for cementing crowns and bridges. It is claimed that with this instrument root canals may be filled without leaving air bubbles.

The Dental Review for June publishes a paper by Elliott R. Carpenter on the Extract of the Suprarenal Capsule and its Dental Use. In this preparation we have a new drug which promises to be of great use as a haemostatic, one that will stop bleeding and do it quickly. When used in combination with powdered crystal Hydrochlorate of cocaine it produces a deeper seated anaesthesia than cocaine alone and one of longer duration. The author prefers to apply the cocaine first then the Suprarenal extract in powdered form. This is used in adjusting cervical clamps, in excising interdental fungoid, in pyorrhea pockets, etc., etc. The application not only acts nicely as an anaesthetic, but makes the operation almost bloodless.

The Dental Review for July publishes "The Treatment of Difficult Approximal Cavities," which was read before the American

Dental Society of Europe by Wm. A. Spring of Dresden. In those cases where the cervical margin of cavity extends too far rootwards to allow the adjustment of the dam, the author, after preparation of cavity, etc., touches the gum with trichloracetic acid to prevent weeping, applies matrix and fills cervical third of cavity with tin-gold 1 to 6. The matrix is then removed, the dam applied and the filling finished with cohesive foil.

In the May number of the International Dental Journal is published "An Attempt to Explain the Sensitiveness of Dentin," by Alfred Gysi of Zurich. The author starts with four fundamental propositions viz.: 1st, No nerve fibers have been found in the dentin. 2nd, Dentinal Canals are filled with a watery organic substance. 3rd, At the inner border of the dentin exists a rich net work of nerve fibers. 4th, Water is practically an incompressible substance. From these data this writer argues that the pain felt on excavating a cavity is due to the pressure produced by the bur or excavator which is transmitted without diminution by the contents of the tubuli to the nerves below the odontoblastic layer of the pulp.

The pain from the application of salt, sugar, etc., is supposed, under this theory, to be due to the reverse of this, or a pull due to the affinity of these substances for the watery contents of tubuli.

This author believes it impractical to undertake to relieve the hypersensitiveness of dentin at one sitting, and advocates sealing in the medicament for 24 hours, thereby giving the agent time to act.

In a paper on "Some New Appliances," read by H. F. Hamilton before the American Academy of Dental Science, and published in the International Dental Journal for June, the author submitted to the Academy a suction device for the relief of pressure in a forming abcess and for drawing the pus from a blind abscess. The appliance is used in connection with the saliva ejector or a bicycle pump in which the valves have been reversed. It consists of a tip made of a metal tube, one end of which is of a size to slip into the ejector tubing, and the other end small, so as to allow its entrance into a cavity of decay. A concave disk is soldered about ¼ inch from the small end, and in using this is filled with softened gutta percha and pushed into the cavity; the gutta percha shutting off communications with the outside, the power of the ejector is brought to bear on the interior of the canals.

The International Dental Journal for June gives us a review of a paper read by Dr. Mendel Joseph of Paris before the Odontological Society of that city, in which we are given several new ideas in pulp capping. Dr. Joseph divides cases suitable for capping into three classes: 1st class, where there is a thin layer of dentin protecting the pulp; 2d, where the pulp is laid bare by the operator; 3d, where the pulp is exposed by progress of caries without symptoms of inflammation.

Great stress is laid on importance of Sterilization of dentin in the bottom of cavity, and the use of an antiseptic for this purpose that will not irritate the pulp. The essayist claims that one of the principal causes of failure in capping is the degeneration of the pulp, especially the calcic form, which is brought about by the efforts made by it to produce a deposit of secondary dentin. Plaster of Paris is recommended here for the first time, so far as the essayist knows, for sealing in dressings. It may be flowed over the dressing without pressure, does not irritate, is easily removed, and seals the cavity. The method in short is—Cavity excavated, washed and dried, and a pledget of cotton wet with chloroform is applied while dressing is being mixed. The dressing consists of Zinci Oxidi grs. 11, Cocaine Hydrochlorate gr. 1, Guaiacol q. s. to make a creamy paste. This paste is incorporated with asbestos fibers to give body, is applied over the pulp and sealed with plaster for 24 hours. At a second sitting a dressing in which 2 grs. of salol takes the place of cocaine is applied, to be left 48 hrs. The third dressing of same composition is allowed to remain four or five days. The final capping of zinc oxidi and guaiacol mixed thick and incorporated with asbestos is sealed with plaster. When plaster is hard cement may be placed over this and cavity filled with gold. After using the above method in 90 cases the author has had no failures.

The International Dental Journal for June published an extract from a German paper which advocates carbonic acid gas as a means to control hypersensitive dentin. This gas is used in general medicine to procure relief from pain in carcinoma of the breast and uterus, and in Neuralgia of the uterus, the effect lasting from one-half to one hour.

The apparatus necessary in applying gas to the dentin consists of a bottle which is filled with the gas under pressure and to which is

added a warming apparatus and mixing tube. By means of the mixing tube cocaine is mixed with the gas. The author uses first the pure gas thrown into the cavity at body temperature, followed by gas mixed with a 20 per cent solution of cocaine, and finally pure gas again. Anaesthesia is claimed in 2 to 3 minutes.

The International Dental Journal for December published by D. D. Smith of Philadelphia a paper on "Oral Prophylaxis." Dr. Smith's ideas as advanced in "Prophylaxis in Dentistry" published in 1898 are well known.

In the article under notice the further position is taken that by his methods the teeth are not only rendered immune to caries but,—to use his words,—"There is an evident stimulation of the life forces of tooth both thro' pulp and pericementum. The benefits are not to enamel alone, but are equally pronounced in pericementum, gums, Alveolar Structure and apparently in dentin and cementum. The stimulation from the treatment rapidly changes the color of the tooth, diminishing its sensitiveness and greatly improving its quality."

The International Dental Journal for December publishes "A contribution to the Sterilization of Dentin in Living and Dead Teeth" by J. Choquet of Paris.

This paper is a development along the lines of a paper presented by the same experimenter before the International Dental Congress, on the recurrence of decay under perfect fillings. In that paper he quoted Galippe, Miller and others, and reported original experiments to show that the recurrence of decay under perfect fillings is due to the development and action of those Micro-organisms which we know to be left in the tubuli of the dentin, even after the most radical preparation of cavity.

In the present paper Dr. Choquet presents a method for Sterilization of cavities and reports experiments to prove its efficacy. The difficulty to be overcome is that of penetration, and this is effected by his method. His experiments in the laboratory show that alcohol will penetrate dentin which has been previously dried, but will not penetrate the moist tissue. This he thinks the important point. The method consists of, first, Mechanical cleansing of cavity; second, dehydration with cool air and the energetic action of alcohol of increasing strength; third, dry with hot air and apply alcholic solution of xylol, geranium essence and hydronaphthol. In case cavity

is shallow the filling may be put in at once. If large it is dressed with the above mixture sealing same for 24 hours and then filled. Experiments on teeth treated after above methods showed completely sterilized dentine.

Excerpts from the Dental Cosmos are prepared by *Dr. J. L. Mewborn* of Memphis, Tenn., and presented by Dr. W. M. Slack also of Memphis, as follows:

In reviewing the different months of the Dental Cosmos for 1901, I find that a large proportion of the matter contained was reports of papers and discussions at the Third International Dental Congress at Paris in 1900, and the National Dental Asociation. In the January number of the "Cosmos" eighty-five pages are devoted to these papers, which were read in 1900, and absolutely nothing showed to the credit of 1901.

In the February number of the Dental Cosmos there are several good papers of 1901, containing some ideas both new and good. The paper by Dr. W. A. Spring on the importance of a proper biscuit bake, should be studied by those who do inlay or any kind of porcelain work. The Doctor makes it plain that owing to the fact that porcelain shrinks one sixth its bulk in fusing it is necessary to bake twice; of vital importance that the first should be a biscuit bake —not over-fused, or the next will be porous, and the result very rough, dirty and unsatisfactory. Many good points are made in this paper, and all interested in this class of work should hunt it up, and study it carefully.

On page 157 the discussion on Dr. Burke's paper—"The Best Material for Filling Temporary Teeth"—by Drs. Register, Hickman, Luckie, Libby and Kirk, brings out some important advantages that copper amalgam has over any other material for this purpose. Not so thorough excavating, requires less pressure, its chemical effect on soft and hyper-sensitive teeth, etc. Dr. Black's experiments show that it is the only amalgam that does not expand or contract, and especially suited to buccal surfaces of lower molars.

On page 247, March "Cosmos," Dr. W. A. Mills has a short article and a number of cases in practice in which the most violent and persistent toothache could be accounted for in no other way than as a reflex of La Grippe. In most of these cases the tooth supposed to be the cause of the trouble was found to be in a normal

condition, not sensitive to heat, cold or percussion; and still after using counter-irritants and analgesics, patient would return next day begging for the tooth to be extracted, or "he would go mad." No doubt many of the painful conditions of the teeth and Sinuses of the face of obscure origin are reflex of La Grippe, and will disappear on recovery from that dreadful malady.

From the very thorough investigations of Dr. I. F. Low on instrument and instrument case sterilization, page 881, August "Cosmos," after experimenting on instruments selected at random from the cases of the most careful operators, it seems that some change should be made in the construction of dental cabinets, so that the fumes from a formaldehyde generator can reach every apartment, then the whole outfit can be thoroughly sterilized during the night as he describes.

Dr. M. C. Smith's discussion of a paper on correcting irregularities—Page 938, August "Cosmos"—should be studied carefully. I agree with his conclusions that Dentists who attempt to correct irregularities of the teeth, especially that variety known as "saddle arch," must learn that if the cause which brought on the trouble continues, the trouble will recur, and if their operation is to succeed the cause must be removed, and the patient must be able to breathe naturally through the nostrils, and must acquire the habit of so breathing. In nearly every case, no matter how long the retaining appliances may be worn, unless these adenoid growths have been removed from the post nasal region, the patient is still a mouth breather, and on removing the appliances the deformity will return.

I furthermore believe it to be our duty to urge parents to watch their children between the ages of six and twelve, and if it is found that the little ones do not breathe easily and freely through the nose, while asleep, a specialist should treat the case at once.

I am glad to see the subject of Oral Hygiene in our Public Schools coming to the front. The paper by Dr. G. H. Hardisty—Page 950—is a valuable contribution on this subject. Every dentist should study it, and carry out his suggestions.

In the September "Cosmos"—Page 1022—Dr. J. E. Hinkins of Chicago describes his method of using (what he calls) a preparation of Dr. Kowarska's, who is a Russian.

This acetone solution of celluloid makes a valuable splint for

loosened teeth used as he describes, also for many other purposes. I have been using it for four or five years by mixing about ¼ in bulk with cement, and hardening it by a method of my own, with very satisfactory results. It makes the filling more impervious to fluids, and is affected less by acids, therefore trebling the durability of the filling.

W. M. SLACK,
J. E. CHACE,
J. J. SARRAZIN, *Chrmn. of Committee.*

Dr. Sarrazin announced that the first paper on Operative Dentistry would be from Dr. Chas. A. Bland, of Charlotte, N. C.

Dr. Bland read a paper on

AESTHETICS IN OPERATIVE DENTISTRY.

When I consented to prepare a paper on Operative Dentistry, I was not unmindful of my temerity, a mere tyro attempting to present something new to this society. Appreciating that this is an impossible task, I shall merely endeavor to evoke discussion on some subjects which will bring out new ideas from the more experienced members. If I succeed in doing this I shall be content. Mechanics and aesthetics should go hand in hand in Operative Dentistry. What we are striving for is permanency and beauty, this rare combination in a filling material is yet to be discovered. The gold filling when properly done is from a mechanical standpoint by far the most permanent, but beauty is sacrificed for durability. However, when it becomes necessary to show gold at all, the cavity should be cut boldly to the front and the margins made to assume graceful curves; attempts at concealment, which result in irregularity of margins, proclaim artificiality more than when no effort is made to hide the gold. To place gold crowns in conspicuous places in the mouth is a violation of good taste and is condemned more by the profession than the laity. Dr. Herd's anecdote told at the Niagara meeting of the National illustrates what our patients think of an unnecessary display of gold.

A well-known New York dentist told a French lady, "I can put white filling, only gold is so much more permanent." "Yes," she answered, "but over in France we would rather be temporarily beautiful than permanently ugly." The highest art is to conceal art, but let us be sure it is concealed. Dr. N. S. Jenkins of Dresden, Ger-

many, has given to the profession a process of Porcelain Enamel Inlays, which gives promise of wonderful development, but it is yet to reach the position of superiority over other filling materials. The apparent difficulty in getting the proper color makes the filling more noticeable than if gold had been used. I have seen some porcelain fillings which looked as if the operator was color-blind. Of course the strength of the inlay is yet to be determined, as it is in the experimental stage. There is more to be considered than perfect selection of color, viz., the restoration of the shape of the teeth. Perfect contour work can be accomplished by the use of gold, when it is necessary to resort to extension for the prevention of recurrent caries. Gold, so far, seems to be the only filling material which meets all the requirements, but even gold has its limitations. Despite the dogma which asserts that any tooth in the mouth can be successfully filled with gold, there are teeth which can be saved with amalgam better. However, gold is without doubt and will continue to be the most satisfactory material, unless supplanted by the inlay. Can Porcelain Enamel be used with the same facility as gold? Can it be manipulated in all, or even in a majority, of cases which present themselves? Can it be placed on the grinding surface of teeth with the assurance that it will not fracture? If so, it is the ideal filling material. In the early days of dentistry the saving of teeth was the only consideration, nothing was thought of the disfigurement occasioned by the removal of tooth structure. No effort was made at restoration of form, but to-day aesthetics play an important part in Operative Dentistry. The mechanical part of all dental operations should be done with mathematical accuracy. After we have attained this degree of efficiency we can advance rapidly until we have achieved great success in the concealment of our patchwork. There seems to be a prevalent idea that science is antagonistic to common sense; there never was a greater mistake. Is it not common sense to make our work as near like nature as possible? The artist of consummate skill makes his pictures resemble nature so closely that we are lost in wonderment. Is this not common sense backed up by scientific knowledge? In our vocation we have as a profession become wonderfully skilled in the practical part, and it is now time for us to study the relationship our work bears to other parts of the human anatomy.

Recent investigations have conclusively proved that some of the diseases peculiar to the oral cavity have more than local significance. It is now claimed that pyorrhea is not only intimately associated with other systemic disturbances, but is in reality the exciting cause. Thus science and handcraft sustain each other. By our skill as mechanics we prevent the loss of dental organs and our scientific knowledge enables us to see and appreciate the results of our work. Science helps us to continue our advancement after all the possibilities of mechanics have been exhausted, and the contempt once had for the so-called theorists will give place to admiration of their splendid success in pointing the way to perfection in Operative Dentistry.

DISCUSSION ON DR. BLAND'S PAPER.

Dr. A. R. Melindy, of Knoxville, Tenn., opened the discussion with the following remarks: "This subject, sprung upon me suddenly, I find myself very much in the condition of a gentleman, who, on being called upon to speak at a banquet, arose and asked what he must talk about. Some fellow in the hall said: "Talk about a minute." Applying this suggestion to myself, I will proceed to talk about a minute.

I think the paper is very timely. Our attention should be called to Aesthetics in Operative Dentistry. We are living in a busy age. We are living fast. We are inclined to sacrifice too much to lack of time, and fail to make our operations as beautiful as they might be. We fail to conceal gold for lack of time in obtaining separation. We are too anxious to save time to ourselves as well as to our patients. I do not think the essayist gives to porcelain inlay that credit which is its due. He seems to look upon it as in the experimental stage. I think it is a fact that porcelain inlay work has passed the experimental stage, and, if placed where it is indicated, is as permanent as any other filling material. With all the filling materials we use, their usefulness is limited. Porcelain inlays are limited to the front teeth, and possibly to a limited number of positions on these teeth. Where it is indicated it is just as permanent as any filling material.

I repeat what I said in the beginning of this minute talk, that it is very timely that our attention should be called to Aesthetics in Operative Dentistry. As to the general points laid down in the

paper, I think we all agree. Let us take more time than we have in the past to obtain separation, conceal our work, and thus add to the beauty of our patients' mouths.

One point occurred to me, not mentioned by the essayist, and that is the matter of bleaching teeth. We should take more time in bleaching those teeth that are in conspicuous places, for a discolored tooth is quite as objectionable and unsightly as a large patch of gold.

Dr. J. P. Corley, Greensboro, Ala.:—I most heartily commend the essay both as to arrangement and subject matter. I am especially delighted with the paper in that it clearly indicates lines which we may follow and develop. Some points mentioned are of particular value in practice. I had the privilege of reviewing the paper through the courtesy of the Chairman of the committee, and had prepared some notes for this discussion, but left them at home, and have to apoligize for this impromptu discussion. We have so many big guns with us that I am reminded of the story of the eagle and the owl. When a man is naturally very timid, he is more so amid these circumstances.

In reference to the first suggestion—permanency coupled with aesthetics—we certainly have to stick to gold as a rule. The suggestion of graceful curves is a good one. Unless we are very careful in the preparation of these cavities, we will cut off enamel that might be very useful. It is wonderful what a frail wall of enamel can be conserved by proper manipulation. If we will take time and get sufficient separation, we will have to cut very little of the labial enamel. I do not criticise the essayist at all, but we might fall into this habit.

In regard to the matter of gold crowns in conspicuous places, it has been a mystery to me how any man, styling himself a dentist, could place in the mouth of a human being, or a monkey, either, as for that, a gold crown where it is unavoidably conspicuous. There may be cases where it is permissible, but they are extremely rare, and I trust I will never have such a case to deal with.

In regard to porcelain inlays, we have enamel experts with us, and I cannot say much about them. I may, however, answer some questions of the essayist. Are they valuable in all cases? No; there are many cases where they are not only not valuable, but not even desirable. A paper by Dr. Evans in the Cosmos for Jan., 1902, pre-

sents very clearly the localities in the mouth where enamel inlays are indicated, and they are very rare indeed. It is like the cowboy's pistol—when we need it, we need it bad. There certainly are wonderful possibilities along this line, but I will leave this to the experts who are with us.

I am very much pleased with the gold inlay in conspicuous places. You can use 20-carat gold solder and get a better color scheme than where you use gold foil. When covered with the natural secretions of the mouth they are agreeably harmonious. You can get beautiful contour simply by the flowing of the solder. You can usually get sufficient space to enable you to introduce them into approximal surfaces of the anterior teeth. I have had very good success and some beautiful results from this class of work.

In regard to the use of porcelain inlays on grinding surfaces, I would prefer gold inlay. Several methods of making these gold inlays have been described in our Journals, and I would most heartily recommend them to your consideration.

In regard to amalgam (if Dr. Crawford is not in the house), I agree with the essayist. You would deprive the public of three-fourths the valuable service which the dentist renders if he were deprived of the use of amalgam. This does not refer to Nashville, but I say in the rank and file of the dental profession amalgam is a godsend to the public, and, if you deprive the dentist of the use of amalgam, the public would lose the most valuable service which is now secured to them through operative dentistry.

Dr. Jules J. Sarrazin, New Orleans:—I thank the essayist very much for his timely paper, but I do not agree with him in regard to inlay work being in its experimental stage. As to placing margins hidden from view as much as possible, both prophylaxis and the position of the enamel rods, opening like the blades of a fan, with short rods between them, constantly compel reaching tooth portions exposed to view to insure ultimate success.

In regard to metal inlays, I fail to see their advantage over foil from an aesthetic standpoint. We have three different shades of gold-platinum foil, which we may adapt to the temperamental appearances of our patients. Do not understand me as condemning gold inlays. I think them most excellent. We have cases where gold inlays can be used to a great advantage, and are very valuable. We

can use metal inlays almost wherever cement can be used. We can get the same restoration as with gold foil and add very much indeed to the duration of the filling over what we get from cement. By the use of retentive dovetails, metal inlays need not depend upon cement adhesion for strength.

Dr. L. G. Noel, Nashville, Tenn.:—I want to emphasize the statements made by Drs. Melindy and Corley in discussing this subject, with regard to taking time to obtain good separation. In the remarks I am going to make, I wish to confine myself to the anterior teeth, because the paper could be applied mostly to the visible teeth—the six anterior teeth above and those below, possibly including the bicuspids. When a patient applies to us for filling cavities in these teeth, very often it is a question as to how we shall approach the case. We have a choice in the matter, and those operators, that are the great advocates of cohesive gold, are disposed to take the short cut. He will approach the case from the labial surface, and cut away valuable enamel. When we cut away the labial plate, we almost always cut away too much in order to get free access to the cavity. It may do for porcelain inlays, but it is very questionable whether it is good practice. Not being an expert in porcelain work, I leave this for those skilled in that art for decision. I want to emphasize a question I brought before you at the last meeting. I would urge the approaching of these cavities from the lingual surface. The labial plate of enamel is much stronger than the lingual plate. In mesial cavities, where decay is progressing from the lingual to the labial plate, the lingual plate is very much weaker. If we cut away the lingual plate, we give ourselves much room for the insertion of gold. If we do not cut the lingual plate away, when we let these teeth come back together we have a crumbling of that most thin plate of enamel, and have to do our work over again, probably having to cut off the tooth and put on a crown. I would like to urge upon the profession at this time the importance of paring away the lingual enamel and approaching the case from the lingual surface, as described by Dr. Robert Arthur years ago. In this way we get a much more perfect operation, and leave no short rods of enamel to crumble away.

Clinical observation shows that the manipulation of the non-

cohesive foil, as outlined above, makes much better operations and lasts longer than cohesive foils.

Dr. T. W. Brophy, Chicago:—I think I am especially fortunate in being with you today to listen to the addresses that have been delivered. The last subject, presented for our consideration, is one that every practicing dentist should be especially interested in. It outlines a course of treatment that enables the skillful operator to more successfully imitate nature than by any other method. I think we all have noticed that sometimes the effect of some of our most trying, difficult and tedious operations; those that are being made at the expenditure of much energy on our part as well as on the part of the patient, although they are really beautiful, they fall short of imitating nature. Now, with the advent of porcelain, we are able to so successfully imitate nature, that only those who are skilled in the work will notice that anything has been done. Large conspicuous gold fillings in the teeth disfigure the mouth, and anything we are able to do in imitating nature should be welcomed with delight on the part of our patients as well as ourselves.

I have no desire to comment upon the crown work being done. Crowns are a great help to us, they enable us to preserve teeth, that otherwise, would have been lost. With our knowledge of porcelain work developed, it removes the necessity in many cases of placing gold in any of the teeth anterior to the molars. Dr. Jenkins, of Dresden, Germany, has done a great work in the developing of this material. I know him quite intimately, and his work is a credit to himself as well as to the profession. Our uses of porcelain are, to a great extent, limited. He goes beyond the steps we take, and restores great sections of teeth. He is removing one of the most objectionable feature of our practice by placing porcelain so as to approximate nature.

Dr. A. O. Hunt, Omaha:—I haven't very much to say in discussing this subject. The particular feature of the paper that interested me more than any other part was the question of inlays. The experience the profession has gone through with in this class of work has been very peculiar. At best, I think it is at present in the experimental stages. The greatest difficulty in the use of these materials is that they are not of sufficient density. They are more or less porous. More of us like gold better than porcelain inlays.

In the last few years the manufacturers have given us a material that they claim is of the same texture as the artificial teeth. The results from the use of this are beyond anything we have ever had in gold, from the aesthetic standpoint, in preserving teeth that are well organized.

We all know the difficulties we have to contend with in placing fillings in young mouths. Almost every material we use, the teeth disintegrate more or less. My experience with cements has demonstrated the fact that, at least, only a limited amount of disintegration and decay occur where they are used, but they wash away, and have to be constantly replaced. Porcelain inlays are particularly adaptable to this class of patients. We have the benefit of the cement lying against the tooth structure, and there is very little disintegration and breaking down occurring between the porcelain and the tooth structure itself. This porcelain gives a material that will stand any condition that may exist, and seems of great advantage in placing this class of fillings in young teeth. We get the same results with metal inlays in posterior cavities. This kind of operating will give us as good results as any other operation. They are of especial advantage from an aesthetic standpoint. The profession in general has not yet adopted these methods of preserving this class of teeth, but it is moving in that direction, and it will become more and more practiced by the profession, and with satisfactory results. It is one of the things we shall feel, in ten years from now, that we will be absolutely helpless without the use of it.

Dr. J. Y. Crawford:—I thank the gentleman for presenting the paper. I am very glad indeed to have heard the discussion. I noticed that Dr. Corley refers to metal inlays as being especially good practice in large jaw teeth. I am an advocate of inlay work, and would advocate porcelain inlays if I felt that it would ever be of any special consequence to the profession. I have thought of this from time to time, but I do not believe the dentist will ever succeed in baking that character of porcelain that we can rely upon. I believe there are some that will produce good results, but it will never be used as extensively as the various filling materials in filling cavities of the teeth.

Dr. Bland:—In closing the discussion, I wish to say that my main object in presenting this paper was to bring out some points I was

not familiar with myself. I know very little about porcelain inlay work, and wanted to know what had been done in this direction, and what is best suitable for this class of work. There is great benefit derived from the color of porcelain, but is its durability what it should be?

The subject was passed, and meeting adjourned until 8:30 p. m.

The regular business session for Tuesday night was dispensed with, and Dr. T. W. Brophy, of Chicago, entertained the Association with a very interesting and instructive lecture on operations for the closure of cleft palate, hare lip, etc., illustrating same by some very beautiful drawings shown through the projectoscope.

Dr. Brophy's lecture appeared in the Cosmos for April, 1901, under the head of "Surgical Treatment of Palatal Defects."

After the lecture the Association showed their appreciation of Dr. Brophy's efforts by extending him a rising vote of thanks.

SECOND DAY.

The morning hours of the second and third days were devoted to the following clinics, as reported by Dr. T. P. Hinman, Atlanta, Acting Chairman of the Clinic Committee:

Dr. J. A. Chapple, of Atlanta, showed a very ingenious instrument, of his own invention, for the checking of the secretions from the Stenson duct during an operation. He demonstrated the practical use of same by applying it in the mouth of the patient. The instrument consists of a wire spring clamp, flat at the beaks. When applied in the mouth, one beak comes on the outside of the cheek, and the other beak extends over the opening of the duct inside the mouth. Bibulous paper is placed between the beak of the instrument and the opening of the duct. Dr. Chapple claims this to be of great help to him in short operations, such as plastic fillings, keeping abutments for bridges dry, etc.

Dr. W. D. Wells, of Macon, Ga., gave a very interesting and instructive table clinic, illustrating the practical working of the Parker Shot Swager in swaging metal plates, etc.

Dr. W. T. Martin, Yazoo City, Miss., exhibited his intra-alveoli forceps for the extraction of roots of teeth. The beaks of his for-

ceps are so shaped as to readily cut and press outward the alveolus as they are pressed down on the root.

Dr. H. H. Johnson, Macon, Ga., demonstrated a method of making porcelain faced crowns that would give the strength of the Richmond crown, without the necessity of having a band showing in front. His method of procedure is to make a band to fit the lingual half of the roots, then fit the disk of gold to the end of the root, as with a Morrison crown, solder the half band to the disk, solder in pin, and proceed the same as with the Richmond crown.

Dr. Johnson also demonstrated his method of getting an accurate articulation for gold crowns, and also a new method of soldering or filling the cusp. He first fits the band; then solders a cap of thin pure gold over the top, cuts a hole in the center of this; then he takes the bite, stamps the cusp, and tacks the cusp to the band. Next he places on the tooth and lets patient bite into the cusp to verify the articulation, and then fills the cusp through the hole made in the cap.

Dr. John R. Beach, of Clarksville, Tenn., had on exhibition a swaging machine for backing up porcelain facings in crown and bridge work. The instrument is made from two pieces of brass tubing about ¾ inches in diameter, with guide pins on the upper half, and grooves in the lower, to guide the two pieces in coming together when swaging. Both halves are filled nearly flush with modeling compound, allowing about enough space between them for a facing. The gold is cut the size to fit the facing, holes punched, and placed on the facing; this is then placed in the swager, and the two halves brought together by blow on the upper half, and the gold is adapted perfectly to the facing.

Dr. W. G. Mason, Tampa, Fla., demonstrated a method of his origin for making all gold crowns for the anterior teeth. His method is to select a natural tooth, the size and shape of the one to be crowned, invest it in plaster so as to expose one half, then pour plaster over the other half, separate the plaster, leaving the tooth in one half, pour Melotte's metal over this half, remove tooth to the other half of investment and pour Melotte's metal over this half; then stamp the two halves of the crown, and proceed as with the Hollingsworth system.

Dr. R. B. Adair, of Atlanta, exhibited diseased skulls, showing the different phases of Rigg's diseases, also his new instruments for operating upon this lesion. The surgical treatment was performed on one of these skulls exactly as he does in the living subject, illustrating a method of amputating any root of the posterior teeth and diseased bone in extreme cases. Dr. Adair produced several patients, upon whom he had operated several years ago, showing the success and permanency of his work.

Dr. L. G. Noel, of Nashville, Tenn., gave a clinic showing his method of filling approximal cavities in bicuspids with semi-cohesive gold.

Dr. J. Y. Crawford, of Nashville, Tenn., demonstrated his method of making gold inlays in the mouth of the patient.

Dr. C. L. Alexander, of Charlotte, N. C., presented a patient, in whose mouth he exhibited a number of his beautiful cast metal fillings, made according to his method.

The clinic of Dr. Robert Good, of Chicago, included the treatment of two central incisors, upper. He first washes out the pockets well with sterilized warm water, and, after injecting a 12 per cent solution of Cocaine into the pockets, proceeds to clean the deposits from the teeth with Dr. Younger's Pyorrhœa Instruments. After cleaning off all the deposits, he floods the pockets with C. P. Lactic Acid, warmed. This, he claims, will destroy the diseased tissue in the pockets and start healthy granulations, bringing about a union between the hard and soft parts. An idea of the thoroughness of Dr. Good's work is gotten from the fact that he devoted five hours to the treatment of two incisor teeth. On the handles of the instruments that he uses, he has vulcanite bulbs about half an inch in diameter, which enable him to handle the instruments without cramping the ends of the fingers, and interfering with the sense of touch.

Dr. Sam Rambo, Marietta, Ga., demonstrated a method of filling large cavities with a combination of amalgam and cement by the use of the matrix.

Dr. W. Mitchell, London, Eng., had on exhibition some beautiful specimens of porcelain bridge work, also some teeth he had stained to suit special cases. He advocates the use of gutta percha

in setting crowns and bridges. He claims it to be much better than cement for this work.

Dr. Wm. Crenshaw, Atlanta, filled two approximal bicuspid cavities, extending under the gum, with soft gold and finishing with cohesive gold, assisted by the use of his matrix, which is especially adapted to this class of fillings.

Dr. V. Walter Gilbert, of Philadelphia, had a very beautiful display of specimens of the different classes of porcelain work. Dr. Gilbert also gave some very interesting and instructive demonstrations in the baking of inlays and crowns, and also in staining teeth.

Dr. J. S. Thompson, Atlanta, Ga., gave a table clinic illustrating his method of preventing sensitiveness to thermal changes in newly filled cavities, by lining the cavity with asbestos paper saturated with a solution of Gum Cassia and Eucalyptus.

Dr. Walker G. Brown, Atlanta, had on exhibition some nice specimens of his outlay fillings, made according to his method.

SECOND DAY—AFTERNOON SESSION.

Session called to order by the President at 2:30 p. m.

On motion of Dr. J. A. Chapple, Mr. F. O. Foster, Manager of the Atlanta branch of the S. S. White Dental Manufacturing Co., was unanimously elected an honorary member of the Southern Branch of the National Association.

Minutes of last meeting read and approved.

Dr. V. E. Turner, Chairman of the Executive Committee, submitted the following names for membership: Dr. D. M. Yates, Rock Mills, Ala.; Dr. W. O. Talbot, Biloxi, Miss.; Dr. H. T. Stewart, Greenville, Miss.; Dr. W. H. Weaver, Lagrange, Ga.; Dr. A. M. Jackson, Milledgeville, Ga.; Dr. L. P. Anthony, Atlanta, Ga.; Dr. W. M. Zirkle, Atlanta, Ga.; Dr. W. D. Wells, Macon, Ga.

The Committee on the President's address was called on to report, and Dr. A. R. Melindy submitted the following report:

Your Committee on the President's Address beg to make the following report:

1st. We emphasize and endorse the sentiment that the most

cordial relationship should always be maintained between the parent, or National Association, and the Southern branch.

2nd. We must heartily favor any movement that tends to a closer relationship between this Association and the State and local societies in this jurisdiction and would recommend that a committee of three be appointed on State Societies, as suggested, whose duties shall be to keep in mind the time of meeting of state societies and either by correspondence or personal attendance to urge the election of delegates to this Society.

3rd. We urge the importance of keeping in mind the opportunity afforded us by the Dental Section of the Army Medical Museum at Washington of making such contributions of specimens and models as would be of interest.

4th. We believe that the influence of this Society should be given to aid in securing the appointment of dentists on the Medical Staff in each state lunatic asylum.

5th. We hope the committees appointed on Dental History and Insurance Examinations will make *full reports* at this meeting, as we consider these subjects of vital importance to the dental profession.

6th. We regard as timely the reference made to our code of ethics and recommend a more rigid enforcement of its laws.

7th. In regard to change suggested in Article 3, Section 3, last clause, it is the sense of this committee that the wording of the constitution is correct having reference to delegates who are permanent members and are in arrears for dues to this Association.

8th. We concur with the President in his recommendation that Article 8, Section 6, be so changed that the President-elect shall have the authoritty to appoint the Chairman of the Clinic Committee.

9th. We endorse the recommendation in regard to publication of standing resolutions and rules.

10th. We also endorse the adoption of the same rule in regard to the election of the higher officers as is now in force in the National Association.

11th. In regard to error in the election of Dr. W. K. Slater to serve upon the Executive Committee, inasmuch as he is not present and your committee has not been apprised of his application

for permanent membership, we would recommend the election of a member to fill the vacancy.

12th. We most heartily commend our President for the faithful and efficient manner in which he has discharged the duties pertaining to his office within the short time allotted him.

Respectfully submitted.

A. R. MELENDY, *Chairman,*
GEORGE S. VANN,
J. HALL MOORE,
Committee.

The report of the committee was adopted as each section was read until the reading of the sixth section.

Dr. Foster:—I rise to a point of order. It seems we have no opportunity of discussing this report later on after it is adopted. These suggestions are alright, and I do not know that I have anything to say on those sections adopted, but, if we are adopting this report as read, we have nothing but general suggestions that will result in nothing. If we are allowed to discuss the sections later on, I have nothing further to say.

The President ruled that the sections were not open for discussion after adoption, but that each section might be discussed as read before adopting same, and that section six was open to discussion.

Dr. Foster:—Has the Committee any suggestions to make as to the enforcement of this recommendation?

Dr. Melindy:—The Committee did not consider this within its province.

Dr. Foster:—I do not see how we can accomplish anything unless we have some nucleus to work from. I cannot see where any good is to come from it, unless we can get on a working basis.

Sixth section was adopted.

On reading the seventh section, Dr. Gray asked that the original clause of the Constitution be read.

The Secretary read as follows: Article 3.—Section 3.—"All delegate members shall be practitioners of dentistry. They shall be received only from permanently organized State dental societies. They shall be elected by ballot at some regular meeting, and shall be members who have done some meritorious work for the pro-

fession; but no person shall be received as a delegate who is in arrears for dues to this Association."

The President:—From the reading of the report of the Committee, I am sure they did not clearly understand my object in calling attention to this clause in the Constitution. I did not object to its wording. It is complete as far as it goes, but it does not go far enough to make itself perfectly clear. All laws should be so clear there can be no misconstruction placed on them. The question I wish this Association to decide is this; when delegates are elected by the State Societies as honorary delegated members to this body for one year, shall they be required to pay $5.00 dues? This applies, of course, to members who are not already permanent members. Shall an honorary delegated member pay dues? I do not think they should. The honor ceases when you ask them to pay dues.

Dr. Morgan:—The section as read is somewhat different from that that is now enforced in the National Association. We have delegates not only from State Societies, but from local Societies. I agree with the Committee that a delegate member, in order to become a member according to the Constitution, must pay dues and sign the Constitution, otherwise he is not a member and not entitled to the privileges of the floor.

Dr. Johnson:—If the Association fails to adopt that recommendation, then the delegate feature, as far as we are concerned, is a failure. The object of the delegate feature ought to be to induce them to meet with us, and, when we have them here, to so impress them as to induce them to become permanent members. The prime object is, first, to increase the attendance, and incidentally to increase the permanent membership.

Seventh section was adopted.

The eighth section with regard to Article 8, Section 6, being so changed as to give the President the power to appoint the Chairman of the Clinic Committee, called forth the reading of that section of the Constitution, as follows:

Article 8, Section 6.—"The Chairman of the Committee on Clinics shall serve for one year; first assistant, two years; second assistant, three years, to be appointed by the President, the senior

assistant assuming chairmanship as each successive chairman retires."

Eighth section was adopted.

The other sections were adopted without discussion, with the exception of the eleventh, which read as follows: "In regard to the error in the election of Dr. W. K. Slater to serve upon the Executive Committee, in as much as he is not present and your Committee has not been apprised of his application for permanent membership, we would recommend the election of a member to fill the vacancy."

Dr. Melindy explained to the Association that it was Dr. Slater's intention to attend the meeting and make application for permanent membership, but that he was unavoidably prevented from attending at the last moment, and this necessitated the recommendation of the election of a member to fill the vacancy.

Dr. Crawford, Nashville:—With reference to the case of Dr. Slater. I thought he was a member of this Branch. Before the amalgamation of the two Societies, all members living in the territory of the Southern Branch became not only members of the National Association, but also members of the Southern Branch. According to the rules, in order to become a member of the Association, one must come as a delegate from the State Society, with credentials passed upon before being entitled to the privileges of this Branch, but I thought all members of the National living in the South, by virtue of their locality, became members of the Southern Branch. It was upon this ground that Dr. Slater was thought a member, and I think he is entitled to hold membership in this branch, from the fact that he is a member of the National Association.

Dr. Mason, Tampa, Fla.:—Replying to Dr. Crawford, I would like to say, that, if one wishes to become a member of the Southern Branch, he must pay dues to this branch. A member of the Southern Branch is a member of the National also, but not vice-versa.

The Secretary being called upon to read the article of the Constitution covering this point read as follows: Article 3.—Section 1. "The members of this Association shall be of three classes, viz.: Permanent, delegate and honorary members; the two former classes

having equal rights and privileges, except that none but permanent members shall be eligible to office." Section 2.—Permanent Members. "Permanent members shall consist of those who, coming as delegates and complying witth the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership."

Dr. Foster:—It seems that in the reading of that clause, Dr. Slater would not be a member of this Branch. He is a member of the National as a delegate from the Tennessee State Society, but is not a member of this Society.

Dr. Johnson:—It seems that the question before the house is whether he is a member of the Branch or not. 'Tis not a question of his eligibility. He may have been a member before the amalgamation, but is he a member now? We cannot make an officer of one who is not a member of the Southern Branch.

Dr. Melindy:—According to the reading of the Constitution of the National Association, members of this Branch are members of the National, but the converse does not necessarily hold.

Eleventh section was adopted.

After the reading of the next section, the report was adopted as a whole.

Dr. J. Y. Crawford, Nashville:—I have a few things to say about Dr. Brophy's very interesting lecture made last night. I want to thank him for his presence here, and for the great work he is doing in this line. We are certainly under many obligations to him. He suggested some very interesting technical features with regard to the operation for closing cleft palates, hare-lips, etc. There is a great deal to be learned from the study of this work from Dr. Brophy's standpoint. It is of especial interest to us from the standpoint of the unfortunate sufferers, who are born with these defects, making the appreciation of Dr. Brophy's work all the more marked. It is of special importance in that it saves human life. There is no operation in surgery in which the beneficial results are more marked than in this. The fact that it is capable of preserving human life commends it to us. When children are born into the world with complete cleft of the hard and soft palate, not being able to partake of the food provided by nature, their physical and mental faculties cannot be properly developed, and

operation that will obviate this disadvantage, and place the child on equal footing with those born without any abnormality, I say, is of vital importance to the profession and to humanity.

Dr. S. W. Foster, Atlanta:—I want to thank Dr. Brophy personally for his lecture delivered to the Association last evening, and also for the great work he is doing on this particular line. I have one or two questions I would like to ask Dr. Brophy with regard to his operation for the closing of a cleft: Where it is necessary to perform two operations for the closing of a cleft, how long after drawing the maxillary bones together would you wait to perform the second operation for closing the soft parts? And, further, in running these sutures through the maxillary bone, how long do they have to remain?

Dr. Brophy:—It is not always necessary to make a division at the malar process. It is done only in such cases as would make it impossible to bring the parts into proximity without this. In the event of having a broad cleft in the palate, we make these incisions in order to bring the parts in contact. Pressure upon the sides of the bones will serve the purpose of bringing the jaws in contact. These wires are adjusted and the parts kept in contact by pressure for about five or six weeks, sometimes longer. I remember one case where the wires remained in three months. When the patient returned, the parts were firmly knitted with no special detriment to the tissue. No marked inflammation followed, nor any breaking down of the tissue. I have never seen a case of the breaking down of the hard parts from such pressure. The bone tissue ordinarily requires six weeks to reunite. After the bone tissue is thoroughly adapted, we allow it to remain two months at the shortest. The plates are removed by raising the plates from the tissues, clipping the wire, and removing one plate, and then the other together witth the wires passing through the tissues. Some six months should pass before the soft palate is operated upon. After we have the pre-maxillary bones brought back into position, we then operate upon the soft palate.

Dr. Foster:—With regard to passing the sutures through the plates, do you have the wires passing through the pre-maxillary bones four different times, and do you have two loops—one at each end of the lead plates?

Dr. Brophy:—If the tissue is wide, we have four sutures passing through. The technique should be clearly understood before attempting this operation. Use strong needles, carrying strong silk sutures through the tissues at the median line, having the silver sutures attached to this silk suture in order to carry it through the plates. The needles are not used to carry the silver suture through the plates. The stiffness of the wire makes it difficult to carry it with the needle. The silk, however, is pliable, and may be carried through the tissues with no difficulty, and, when we get the silk sutures through the wire sutures are easily carried through the plates, and the parts are brought into proximity by pressure—simply twisting the silver wires together. We do not divide the bone through the entire length at the malar process. It is only divided about half way. . When this has been divided, we find that the tissues will stretch something similar to the bending of a green stick. With pressure the two sides may be brought into proximity.

Dr. Bland:—What effect does this operation have on the voice?

Dr. Brophy:—In all the cases that I have seen there is no difficulty with the voice as compared with the voice of others. Their articulation is usually very good.

Dr. Crawford:—In older patients, how long do you let the sutures remain?

Dr. Brophy:—The silk sutures are removed in about a week, except in certain cases I may leave them nine or ten days. Usually the coaptation sutures are removed in a week. The lead plates and silver sutures are allowed to remain two weeks, sometimes longer. After having the parts well united, it is better to let them remain a little longer, so that the parts will become strong, and prevent any foreign substance from being forced through. I remember in one case, that I operated upon with good results, after I removed the coaptation sutures and lead plates, and dismissed my patient, the family had a reception at the Palmer House to rejoice over the result of the operation upon the child. During the evening the child forced something through the tissues, opening the cleft again. I was sent for immediately, and had to perform three operationc before succeeding in closing it the second time. This simply illustrates the value of allowing the parts to grow to-

gether and reunite firmly. The question was raised in New York last winter about putting something in to keep the patient from forcing any foreign substance through the tissues after the operation. It was suggested that a rubber denture be made, and placed in the mouth as a protection to the parts. I have never used such a protection, and do not think it necessary.

Dr. Chase, Ocala:—How many cases prove failures?

Dr. Brophy:—In the address that was delivered at Paris, which was distributed to you last night by Dr. Chapple, I reported all cases, and out of that number two deaths occurred, which I did not attribute to the operations, but to the conditions that followed two weeks later. Unfortunately, the second patient I operated upon died. The patient had not only a double hare-lip and cleft palate, but the fontenelles were involved. In both these cases meningitis resulted almost simultaneously, and we could not save them. It seemed to be more from external conditions than from any other.

On motion the subject was then passed and Dr. L. G. Noel, of Nashville, Tenn., read a paper on

A Case of Alveolar Abscess with Opening upon the Outside of the Face Caused by Death of the Pulp in a Third Molar Independent of Caries.

In October last Mr. M., a gentleman aged about 30 residing in West Tennessee, applied for my advice about an abscess opening upon his face at a point about mid-way between the mental symphysis and the right lower wisdom tooth, and upon the body of the lower jaw. An examination of his teeth revealed no cavities that could be the cause of this condition, nor was there at this time any pain caused by tapping sharply upon his teeth with the handle of a heavy steel instrument. Upon questioning my patient, I brought out the following facts: He had had repeated swellings in the gum and underlying tissues about the right lower wisdom tooth, sometimes involving the throat which would become intensely sore. These attacks had lasted sometimes for weeks at a time and had been experienced at intervals through a period of six years. (Perhaps ever since the eruption of the wisdom tooth.)

There was a rather crowded condition of the teeth in the jaw, but not extraordinarily so, the wisdom tooth was fairly well placed

and fully erupted. The last swelling and closure of the jaw had occurred in June and had been the most serious attack of all. The patient had sought the advice of a physician who, after a number of days of treatment, had lanced the abscess from the outside of the face, discharging a great quantity of pus. From that time it had continued to discharge a thin offensive pus, irritating to the skin, and soiling the clothing. At the time I first saw the case in October, all acute symptoms had passed, the patient had regained free use of the jaw, there was no tenderness upon percussion, the teeth were all tight in their sockets and nothing but the appearances then presented and the history of the case to guide to a correct diagnosis. My mind was, however, soon made up and I advised the immediate extraction of the wisdom tooth. When questioned by the patient as to whether this would end his troubles, I expressed the belief that it would, but pointed out the possibility that a small area of necrosed bone might exist and have to be removed surgically before a cure could be effected. Being a very timid man, he deferred the operation, sought the advice of other dentists and surgeons, and at last returned to his home without having anything done for his relief. After the elapse of a month he returned to me and timidly suggested his willingness to submit the case to me, provided I would use anæsthetics. After the injection of ½ grain of Nirvanin into the peridental membrane at several points around the neck of the wisdom tooth, I proceeded to extract it, and though firmly set and difficult, I succeeded in accomplishing this without fracture of either of its roots. I next proceeded to wash out the wound with pasteurine solution, forced through a dental syringe, and was much pleased to find a portion of fluid escaping at the external opening. I then took the tooth to my bench vise in my labaratory and cracked it open. Here I was again lucky, for I had the good fortune to crack it along the line of the canal in the anterior root. The pulp had been dead for some time but its chamber and much of this anterior canal was occupied by a mass of secondary dentine. I present this tooth with my report to verify my statement.

My theory is that the repeated swellings of gum and peridental membrane were caused by particles of food lodging about the gum edges, and undergoing putrefactive fermentation. This produced

a condition of hyperæmia of the pulp which brought about the formation of secondary dentine. This condition of progressive degeneration of the pulp ended finally in its death and the formation of a true alveolar abscess.

When I assured my patient that he would recover without further surgical measures he expressed much delight and told me that he had that day been examined by a surgeon who had assured him that he would have to have several teeth extracted from the affected side and a large portion of the jaw bone sawed out. He had submitted himself to me feeling that he would be fortunate to come off with his life and a part of his face, and, oh joy! he was only minus one useless wisdom tooth. The last time I saw my patient, something like two weeks after the extraction of the tooth, he was doing well. There had been no further discharge and the external opening had about closed.

Discussion of Dr. Noel's Paper.

Dr. T. P. Hinman, Atlanta:—In opening the discussion of this paper, I beg to say that I do not think it has advanced any special theoretical point. It simply shows the great importance of the dental surgeon in diagnosing these conditions. I believe, if the patient had submitted himself to the dentist, there never would have been an opening on the outside of the face. We very often see cases of this kind. The case seems more one of maltreatment on the part of the physician than anything else. If the dental surgeon had been consulted, the opening could have been made just as readily on the inside of the mouth as on the outside.

With regard to the theory that the nerve became involved through conditions outside of the tooth, we cannot find any other theory that would cover the case. As I stated above, it is a case that simply emphasizes the importance of the dental surgeon in this particular class of work.

Dr. M. F. Finley, Washington, D. C.:—I would like to bring out a few points in regard to the knowledge of the general surgeon as to the proper treatment of the oral cavity. I have seen two or three instances where surgeons of much repute had lanced simple dental abscesses on the outside of the face, instead of raising the lip and cutting inside the mouth, as any dentist would have done. I

had a case lately of a young lady patient, who was taken with a spell of sickness and had an extensive swelling on the right side of the face below the ear at the angle of the jaw. The family physician being out of town, I was sent for to see if the swelling was in any way connected with the teeth, I having made a treatment a day or two before in a lower first molar on that side. I examined the case, and decided that it was not caused from the teeth the instant the mouth was opened. There was much swelling and soreness at the angle of the jaw, but none about the teeth. She was wearing a poultice when I arrived, this I removed immediately, and directed simply that she wear a soft flannel cloth to keep in the body heat, as she said she felt more comfortable when the face was warm. I diagnosed the case as one of unilateral mumps, and advised treatment accordingly. My diagnosis was confirmed by the family physician on his return to the city.

Dr. J. Y. Crawford, Nashville:—I enjoyed the report of the case very much, as I had the opportunity of being consulted in the same case. I am much interested with the report of the case and with the management of it, but I am rather inclined to dissent from the gentleman with regard to the appearance of the case. I am rather inclined to think that the tooth had not the appearance of a perfectly sound tooth; also that the devitalized condition was due to conditions outside the tooth. In but very few cases have I seen the pulp of a tooth become involved as the result of outward conditions. I have seen it from exposure of the roots of teeth. I have seen edema of the glottis caused from conditions existing in the tissues around the teeth. As I said above, I was especially interested in the report of the case, and I advised the same thing that Dr. Noel did, which was to extract the tooth.

In many cases of this character, where there is inflammation and swelling around the teeth, caused from external conditions, and especially in cases of the third molar, where they are trying to erupt, and causing irritation to the parts, we had better keep the knife out of them. We had better resort to propping the mouth open. Disarticulate the teeth by the use of an old crown, you have lying around in the laboratory—put it on one of the teeth, and relieve the pressure from the parts surrounding the tooth. We

can very often get good results from this practice, often saving the teeth, without the necessity of an operation.

Dr. R. C. Young, Anniston, Ala.:—Gentlemen, these lower third molars are something to be dreaded. I remember a case I had once. I extracted a wisdom tooth, administering cocaine to anæsthetize the parts, and afterwards it resulted seriously by developing a case of œdema. I had a very hard time treating the case. I thought after that I would not use cocaine in the extraction of teeth.

Another case, fresh in my mind:—A gentleman came to me a few weeks ago, a subject of tuberculosis, looked like he was about in the second stage, suffering extremely with his jaw. After examining the case, I found all the teeth in good condition with an impacted lower third molar, and I decided this tooth was giving the trouble. I tried to put him off. I did not want to tackle the case, but I could not get rid of it. I sent for a physician to assist me in administering the chloroform. I found the third molar pointing towards the second molar. The patient insisted on my extracting the tooth. The physician administered chloroform. I then got my elevator—these are the best instruments for extracting third molar teeth—extracted the tooth and the patient came through very nicely. We have some trouble in getting him under the influence of the anæsthetic. In the afternoon his wife came down to my office and said her husband could not swallow. I gave her a prescription of lead water and laudanum to foment the jaw with, and in three hours after fomenting the parts well with this prescription, the patient was taking raw oysters.

Some days ago a young lady came into my office suffering extremely with a lower wisdom tooth that was trying to erupt. I thought of Dr. Crawford right away. He told me to disarticulate these teeth. I disarticulated them as you told me several years ago. When these third molars are being erupted, do not lance the tissues, simply disarticulate the teeth, and with a wisp of cotton wrapped around a dressing probe, saturated with Pyrozone, wipe out the pocket around the tooth. In like manner follow with trichloracetic acid, full strength, and thus rid the parts of this colony of pus forming bacterium streptococcus pyogenes albus—but do not break the continuity of the soft tissues, and thus give entrance to

greater infection. If the inflammation is excessive, foment with lead water and laudanum.

On motion of Dr. T. P. Hinman, Dr. W. Mitchell, of London, England, was elected an honorary member of the Association.

Meeting adjourned until 8:30 p. m.

SECOND DAY—NIGHT SESSION.

Meeting called to order at 8:30 by President. Paper by Dr. R. C. Young, Anniston, Ala., on

Asepsis.

Infective inflammation is a bacterial invasion of living tissue after an injury or at the time when nature is so impaired that the normal cell elements cannot resist their attack. Infection occurs through the skin, mucous membrane or alimentary canal respiratory tract and genitory nuritory tract and by inoculation during injury and surgical operation.

Cleanliness is akin unto Godliness; a duty well performed is godly, and as cleanliness is the first principal of surgery, it follows as the day follows night, that a want of cleanliness in a surgical operation is ungodly.

Let us differentiate between the terms, antisepsis and asepsis, for indeed there is a vast difference in their practical meaning. The lack of the latter will necessitate the former; the presence of the former demands the latter.

Lister, the great London surgeon, may well be called the Archbishop of Antiseptic Surgery, for undeniably it was through his demonstrations that the gates were thrown open, inviting modern surgery to a field rich in alleviation of suffering humanity.

But it is not here that we hear of the first Aseptic operation. Far down the vista of history, made hoary by the touch of time, in the early dawn of creation. When the first sunbeam kissed awake sleeping life in one grand melody of praise to the great Architect. A deep sleep fell upon the Prince of Creation and from his side was removed a rib, and low, his Queen, fair, beautiful, self-sacrificing, noble woman, the greatest gift of God to man.

Nor was the good Semaritan far behind the present day treat-

ment of wounds, when he found the poor unfortunate, cut and bleeding from the treatment of the thieves; he dressed his wounds with wine and oil, did he know that the alcohol of the wine was detergent, that the acid (for no doubt it was a dry one) was a germaside? The oil excluded the tropic air no doubt ladened with pathogenic germs.

Can we, as Dentists, practice aseptic surgery? Yes, and no. Here we have a field already occupied by countless germs, often those who demand our attention are suffering from abscess, a circumscribed cavity containing pus. Here the pus germ has already possession, or a very common picture, a mouth filled with roots and broken down teeth, gums festering in a bath of pus. Can aseptic surgery be practiced here? No, one must rely on antiseptisism. But you say aseptisism is imperative in all surgical operations, why do we not have pyemina septicemia or a host of evils following the removal of such roots and teeth? May it not be that the patient is immune from germs which are cultivated upon themselves, or is it because this reagon has some special resistive power? There must be a charm, for the countless number of teeth expected with a total disregard to cleanliness, not to mention sterility, is a fact that cannot be denied, and did you ever hear of a person dying from tooth extraction? Perhaps not, but we do see patients who have suffered for weeks after such operation with ulcers, sulff, osteitis, etc., which beyond a doubt could have been prevented.

It is a very uncommon thing for a Dentist to extract a tooth, lance an abscess or do some act of minor surgery, wipe or rinse off the instrument, dry it on a napkin or towel which has been used or exposed to the air of a room which has never been disinfected since it was built. Patient number two comes along, the same instrument is taken from the place where it is kept, not even washed this time, or a tooth is broken in an effort of extracting. After several futile efforts to remove the roots, a digital examination is made, the finger is poked into the hole and the roots felt for. This finger has been in a dozen mouths, handled all sorts of things, possibly money, and a dirtier thing in the germ science is hard to find. It may have been washed with a little water and soap, which was made from the carcus of an animal, dead with

no telling what disease. Patient dismissed without even a suggestion that he use a mouth wash. Yet he lives.

A burr is used, the blades of which are matted and clogged with the debris from another tooth, its cutting capacity has been decreased, not only because it is dull, but the interspaces between the blade are packed with tooth dust, and have to be pressed hard against the tooth to make it bite in. It slips out of the cavity and plunges into the gum. Do we have infection? No. Yet this instrument is undoubtedly septic.

An abscess tooth is treated or a putrescent pulp is removed with a Donaldson broach, a little later another tooth is to be treated, perhaps a pulp to be removed under pressure anæsthesia, same broach is taken up, pulp twisted out, or it may be that an abscess with a fistulus opening is to be made antiseptic, the broach used in the other case is manipulated, perhaps the gum may be probed with this broach. Is it aseptic? Undoubtedly no. If there are such things as germs they are here, a knife or smooth dressing probe might be wiped clean, but not a nerve broach, no, never.

An injection of cocain or eucain is to be made; here a syringe and needle which have been used no telling how many times, or for how many things, not even has all of the last fluid been gotten out of the barrel of the syringe; needle dipped into a bottle of some pattant anæsthetic which has no cocain in it, yes, is full of it; possibly the bottle has been open for a month and the same needle dipped into it over and over again after having been in one gun, then in another. Has it been made sterile? No. Some time ago I was speaking to a prominent dealer in dental supplies. He said that he had that day received an order from a dentist who wanted a hypodermic syringe needle, "a good big one which he could use for injecting cocain and for treating abscesses." Is that damnable?

An examination is to be made; the patient is left in the operating room with a polite "Excuse me a moment, please." Perhaps the hands are given a cold water rinse, the mouth mirror taken from the bracket; if it has a little blood on it, it may be wiped on the hand towel or a napkin. Is the mirror clean?

A Dentist who is quite prominent in society work once expressed to me surprise at my prodigal wastefulness when I told him I did not use a rubber dam after having had it once on. He

said he used his over and over; he washed it with soap and water. Can aseptisism be clean here? Perhaps no.

Well, after all, what does it matter? Nobody was ever poisoned, inoculated or hurt by such things. If it looks clean, it is all right. What you don't know won't hurt you, so says Billy Baxter. I, there's the rub; the finger that makes a vairginal examination often points to the cemetery, and likewise the septic dental instrument may be the signboard to the same city. We may not see the immediate effect locally. Who can dispute the statement that tuberculosis, syflis, diphtheria, etc., can and are conveyed from one subject to another by the use of the same cup or article placed in the mouth, such as a pen, pencil, money, etc. This is a fact, and is irrefutable. There is a case fresh in my mind where the operator was himself inoculated from a syfalitic patient. The case occurred in this city, Atlanta, and is well remembered by a number of gentlemen now present.

Then are we not in duty bound to protect our patients? Is it not a moral obligation we owe them, our profession and ourselves? There is more in heaven and earth per ratio than dreampt of in thy phylosophy. And though the casual observer may scoff the idea, still disease and death often go with dirt we cannot see.

It does not cost much in time or outlay to bring about a reasonably safe aseptic condition of our operative surroundings. First, let us take the care of the hands. Absolute hand disinfection as shown by Welch is impossible, even by the most severe methods of disinfection. We cannot rid the skin on the hands from every bacterium, chiefly because of the presence of the staphylocus epidermidias albus, which inhabits the deeper portion of the gland crypts. After the best of antiseptic methods, bits of skin may be exercised and this germ found therein. Pardon me for using the term, I have a half round tank which holds three or four gallons of water fastened to the wall just over a stationary washbowl. in the bottom of this tank is faucet and a stopcock, every morning fresh water is put into the tank, and a few grains of permanginate of potassium thrown in, just enough to color the water, to cleanse the hands, the cock is open and the hands washed in running water (the basin not being used), and good soap and nail brush briskly used, for it is under and around the nails we find

the most septic matter, and it is difficult to remove; never go from one patient to another without a hand-washing, and often during an operation, if it is a long one, on the same patient. This repeated washing of the hands necessitates some lotion to keep the hands soft. Glycerine, rose-water and a little carbolic acid is excellent; never use perfume or strongly scented soap.

Now for the instruments; fauceps, excavators, burrs, knives, clamps, etc. A sterilizer can be made for a couple of dollars which will do just as efficient work as one that costs ten. Any tinner can manufacture one. A tin pan 6 by 12 inches, 4 inches deep, with a cover to fit close; a piece of flat tin perforated, with a handle on each end, which will fit nicely inside like a second bottom. Upon this the articles to be sterilized are to be placed, a solution of ordinary cooking soda, bicarbon soda, about two-thirds fills the pan and is placed over a Bunson burner or a coal oil lamp used for the vulcanizer, to boil five or ten minutes: lift the false bottom out and the heat of the instrument will drive them off in a few moments; the soda in the water prevents rusting. Of course wooden handle instruments cannot be boiled; just before using a lance or faucep, dip it in alcohol and touch to a lighted match, letting the alcohol burn off. It will not injure the temper of the steel.

Before placing burs in the sterilizer, brush them off with a wet tooth brush or a brush of similar shape.

In treating a tooth which has two or more roots, never use the same broach in different roots without cleansing it, for it may be that all the roots are not septic, and abscesses are often confined to one root, and if an instrument is used into one and then into the other, it is more than possible to carry infection to the other roots. Of course, we would not allow the saliva, under any circumstances, to enter the cavity.

For the sterilization of small instruments, such as probes, broaches, syringe needles, etc., a quick and efficient method is to boil them in a test tube containing a bicarbonate solution. The hypodermic syringe, when not in use, should be filled with an antiseptic solution and never used for any other than a submucus or subcutaneous injection. The needle should be kept in alcohol, or, better still, a five per cent solution of lysol; the most delicate instrument can be kept in this for an indefinite time without in-

jury. If one has a gold or irridiplatinum needle, it can be sterilized in a flame. If one does not think the mouth mirror does not need sterilizing, just let him rub off glass and handle with a moist cloth and he will be convinced. Of course the mirror cannot be boiled; it must be kept in a glass of some antiseptic solution. Let your preparation so shine before your patients that they may see your good work, and they will appreciate it.

Now, I have attempted to advance no new ideas. It was not my intention to give you a deep scientific paper, nor have I exaggerated the conditions which exists in my dental offices.

Although we may never hope to obtain the ideal, let us try to have our environments so that inoculation of one patient from another may be made practically impossible.

Discussion of Dr. Young's Paper.

Dr. G. V. I. Brown, Milwaukee:—I am heartily interested in this paper. I was rather following the bend of my own thoughts than trying to formulate anything I might say afterwards. In the first place he has brought up the question, that is now the all-absorbing question, in regard to bacteria. We had reached the point at which we thought we knew all about them. Bacteriologists were ready to say that certain germs would be recognized under the microscope under certain conditions; that they always had the same effect, and produced the same results. It looked like it would be an exact science, but I think we all agree now that we do not know half as much about them as we thought we did. For instance, we do not see how it is that injections of antitoxin from diphtheria, or from the Klebs-Loebler bacillus, has a very marked inhibitory action in diphtheria.

The other evening I was at a meeting where a paper was read, and the author of the paper had the idea that all germs were one and the same; that conditions surrounding them determined as to whether bacteria would assume a virulent character or not; that the condition of the individual circumstances made a germ that we would recognize as one or another. Of course, this is an extreme view, but it gives the tendency of the study of the present day. The best statements we have upon this subject show great

revolution in the ideas we have had with regard to germs. It only accentuates the opinion with regard to cleanliness. It simply seems to make it more incumbent upon us that we be cleanly. The suggestions are of great value to me. It is one thing to know how to be clean; another to try to be clean, and still another to be able to be clean. He has made it plain to us how to be clean, and shown very clearly that it will help us in all our operations.

Dr. J. P. Corley, Greensboro, Ala.:—I especially enjoyed the paper. As you know, the essays we have been having on this subject have been on the extreme. I think in many instances they have accomplished more harm than good. For instance: The extreme position, that after all patients, automatic pluggers should be sterilized. I am personally indebted to Dr. Young for some ideas given me some years ago in opening devitalized teeth, and have followed them with a great deal of success. The study of asepsis is like a work of romance; the more we study it, the more it grows on us. From the results obtained by the advancement of this theory, we think we are on the right line. We attach too little importance to the immuning effect of bacteria. We got our knowledge of anti-toxins from that source. In aveolar abscess we have a limitation infection because the attenuated toxins render the tissues immune. Some operators are over careful in observing aseptic precautions, but fail to keep the chain unbroken. They sterilize their instruments, but place them on a bracket that gets, at best, only the care of a whisk broom. They render of no effect what they have done. If we undertake to observe absolute asepsis, we will do nothing else than sterilize. It is important that we get down to a practical working basis.

You will pardon me for referring to myself, but when I dismiss a patient my instruments are carried to the lavatory and washed in a stream of running warm water, with a stiff plate brush charged with soap. I scour them thoroughly, and can very readily remove all organic material. The essayist takes an extreme position on the other side. We do not put broaches, loaded down with virulent matter, into the mouth. I have been in the essayist's office, and have seen his sterilizer. It is a good thing. It is well for us to study this question, but don't let us take an extreme position and waste half our life in fruitless labor.

Dr. J. Hall Moore, Richmond, Va.:—One suggestion I would like to make. For years I have had my bracket covered, and where convenient, the drawers of my cabinet lined with glass instead of felt. This makes conditions more aseptic.

My principal antiseptic is carbolic acid. It is a good sterilizing medicament for your instruments. Carbolic acid in solution with soda is a very good sterilizing agent. The soda prevents rust, and the carbolic acid sterilizes. Forceps and all steel instruments should be boiled in the soda-carbolic solution.

Dr. J. P. Gray, Nashville, Tenn.:—I do not care to be classed as being opposed to cleanliness, but it does seem that we carry this too far. We can only take it by comparison. Twenty-five years ago, when I was around a dental office a great deal, they knew nothing of bacteria, and if it had been the case that every time an instrument was used, that was not thoroughly sterilized, it had poisoned the patient, the population would have all been gone by this time. None would have been left for the dentist to work upon. If it will produce more caries by introducing bacteria into the mouth, that is what we are after. We need more teeth to fill. We need more money. On account of so many young men being turned out of the colleges the profession is too full. One way to kill these bacteria is with burs, that is, if they are like some I have seen. They have been used so long, and have become so smooth, and have to be run so fast to cut the tooth structure, that the heat from the burs will kill all the bacteria in the teeth. Using good dull burs has a good effect upon the patient. It impresses upon the patient the fact that they are going to suffer when they come to the dentist, and they try to keep their mouths in good condition to avoid coming to you. To sum it up, we must use judgment in this work. I thank the gentleman very much for the valuable paper.

Dr. B. Holly Smith, Baltimore:—Dr. Gray has made an accusation, which I challenge him now to prove; that the dental profession is full. Dr. Gray may have employed the greater part of his time in trying to make it hot for the human race, but I do not believe he has the right to rise in this assembly and speak lightly of this question. It is a serious matter. Dr. Gray did not mean what he said,

he seldom ever does. I do not think there is anyone here, who knows him, that will take him seriously in what he has said

I think every dentist should study this question more, and their efforts should be to so demean themselves in their practice that they shall have at least the respect of the people among whom they practice. We know that it is not a trifling matter in the eyes of our patients. There is too much constant study on this line of asepticism for us to treat it lightly. There may be some here, that do not know that this gray-headed man with such a long suit of hair has absolutely not been in earnest. I claim that the dentists I have known have been clean men. We should make every effort to have our instruments sterilized, keep our hands clean, and protect ourselves from any accusation of uncleanliness. I think it is useless from our knowledge of bacteria to say anything about the means of sanitation. The methods are too well known in our profession to go into particulars.

Dr. Gray:—I did not know that I was stirring up the gentleman so. I am surprised that he should become so thoroughly aroused over remarks, that were partly in earnest and partly in fun. I know you sterilize your instruments, and I know the dental profession is a clean set of men, but I do not believe all that Dr. Young has said. I believe thorough cleanliness is necessary as much as you do. As to saying I am never in earnest, it is not true. If I have awakened the interest of the gentlemen sufficiently to make him discuss this subject, I feel that I have done some good this evening. As to my long suit of hair, I admit that I haven't as much as he has, but I draw the line on the color.

Dr. Smith:—You Southern people always were inclined to draw the line on color. I apologize to this body for taking up the time, but I say it seriously that I was not willing for anyone to go out of this room under the false impression that was getting out. I knew Dr. Gray would right himself when goaded to it.

Dr. J. R. Beach, Clarksville, Tenn.:—I believe in the sterilization of dental instruments, and think we cannot be too careful in the manner in which they are sterilized. Heat can be relied upon as the best germ destroyer, though it is good practice, in some cases, to immerse the points of the instruments in some good germicide before immediate use.

Especially let us be careful in sterilizing instruments used in the treatment of abscesses; forceps, hypodermic syringe, lancets, etc., thereby running no risk of inoculating the tissues with an infectious disease.

If the essayist is an extremist, though I do not think he is, it is far better to be on that side of this important question than on the apathetical side.

Dr. W. Mitchell, London, Eng.:—I came in rather late, just as the paper was closing, but presume it was in connection with the sterilization of instruments. I heartily agree with what has been said by those who have preceded me, in regard to the necessity of this important branch. It is important in that it aids us to do our work right. We must protect our patients from the ravages of bacteria. We are all impressed with the importance of bacteria, as impressed by the colleges. I can only recommend it to the students, and would impress upon them the necessity of carrying the process of sterilization as they find best according to their requirements, and thereby carry along this work. It is undoubtedly on the right line.

One fact presents itself to my mind; that is, that it belongs to the English-speaking races to be the greatest sterilizers on the face of the earth. Civilization is nothing more than physical and moral sterilization.

We should wash our hands as we go through our operations. It helps us in our operations; makes them more aseptic, and also makes a good impression upon our patients. I think it very necessary to perfectly sterilize all instruments before being used in the mouth. I do not know that I can add anything to what has been said further than the above.

Dr. Young, in closing his discussion, said: "I have nothing more to say except to deny the accusation that I am an extremist. The one thing that impressed the necessity of asepsis upon me was a case of blood-poisoning that I had myself. I treated an abscess, and happened to have a small abrasion on one of my fingers. After finishing the case, and washing my hands I evidently got infection. That night I suffered intensely with pain, and within the next 24 hours large red lines appeared on my arms, accompanied by considerable swelling. It was a plain case of blood-poison, and I am confident that quick treatment and a good constitution saved me.

I keep my sterilizer by my side at all times, and drop my instruments into it after using them instead of putting them back into my case. I thank the gentlemen very much for the discussion of the paper.

The Committee on Education, Nomenclature, Literature, Voluntary and Special Essays, being called, Dr. B. Holly Smith, of Baltimore, Md., Chairman, read the following report:

Mr. President and Members of the Southern Branch of the National Dental Association:

As chairman of your committee on dental education, it is thought well to review briefly the present status of the subject, in order that suggestions which may be made for improvement may come in proper sequence to form successful action. To do this it is impossibe to close our eyes to marvelous changes wrought in methods and theories of training since 1885, when the N. A. D. F. was organized at the suggestion of the late Dr. R. B. Winder of Baltimore.

At that time the dental student who poorly substantiated a claim to five years' pupilage or practice was graduated in one session of five months, and otherwise was permitted to apply for final examination after two years of five months each. The work of that association of teachers has gradually brought the course of instruction from this point to two years of six months, three years of six months, three years of seven months, and finally this year to four years of seven months. It has gradually (some have thought too rapidly) brought our teaching institutions opportunity for not only more extended laboratory and infirmary training, but has widened the field of instruction generally, taking into the curriculum many collateral and associated branches, tending to make the dentist of to-day's production not only better informed, but a better trained man than his brother of '85.

It must not be said that George Washington's cherry tree acknowledgement of "I did it with my little hatchet" is altogether appropriate as a claim for this association. All the time the widest publicity has been given to its proceedings. Comment, both unsought and solicited, has been freely offered in the dental press and at dental meetings. Star chamber proceedings have not prevailed, but in every move the dental profession itself has seemed to be acting. The impatient ones have been held in check, and upon the whole we may say that the wisest counsel has prevailed.

Not the least important of the services rendered to the profession at large by the N. A. D. F. has been the drawing into the interest and discussion of its movements such a large number of men who are not teachers, but have given much thought and study to improvement of curriculum and extension of course of study. Because of this free discussion and agitation there has arisen in this country, we might say, an aristocracy of learning in the domain of dental education, embracing, it is true, many purely theorists, many impractical and speculative formulæ, not a few wild and chimerical schemes, but nevertheless tending to widen and diversify knowledge of the subject.

Dental education is one of the regularly assigned subjects for discussion in all well-regulated dental societies, and perhaps no other elicits such ready and varied comment; indeed, we are almost willing to say that if there lives a dentist, a member of a dental association or not, who is not prepared to discuss the subject of dental education, he is fit for "treason, stratagems and spoils." The average man will not only discuss the subject, but has new and original ideas concerning it. These he offers free, without money and without price. Even these effusions do good, perhaps by way of contrast, enabling those of wider experience and more practice to get the poetic or romantic, or, not less important, the absurd side of the question. I challenge any man, therefore, to say that this subject has not been discussed, or that upon many points there is not generally prevailing a unanimity of opinion.

Not the least uniformly do we believe, both as teachers and practitioners, that the training of the dentist is a special work to be done by practical dentists. We have not, I hope, extended the course of study that men preparing to practice dentistry may dawdle along through the ornamental paths of extra medicine. The danger seems to be just there, that the purpose of the student may become confused by the demand that he select his essentials from medical work, which he is compelled to take along with the medical student, and which more often is prepared for the latter rather than for him. To make myself plainer, I do not believe in the economical arrangement of training dental students in medical classes. The anatomy, the physiology, materia medica, pathology, therapeutics, surgery and all laboratory and infirmary work should be prepared for the dental student, and with a view to fit him to practice dentistry, and not to fit him to rub shoulders with his medical brothers. A knowledge of general anatomy is desirable, but the more particular niceties of this study should be insisted upon from a dental standpoint, and if done from the standpoint of the general surgeon it is at the expense of other essentials of dentistry.

The same may be said for the other studies above mentioned. No one will, in this day of enlightenment, deny that dentistry is a part of the healing art; indeed it is perhaps the most helpful, and certainly most hopeful of success, in its undertaken field; but all the more the training of its votaries must be a special training.

Too much time has been given to the subject to allow compromises in its doing. It cannot be denied that there have arisen in our midst a considerable number of dentists, ultra medically inclined, decrying the strictly dental position and courting medical association only.

A classmate of your essayist, who at his graduation matriculated at a medical university, and after two years graduated in medicine, said a few days ago, as many erring must say: "If I had only spent that time under the pupilage of teachers specially qualified to fit me for the practice of dentistry, how much better it would have been for me and my patients. I have had perhaps one case which my medical knowledge would fit me to treat to one hundred where my post-graduate course in dentistry would have made me accomplished." Dentistry is a wide field, and I do not contend that there are not advantages to be gained by those who are medically educated dentists

and feel their fitness to do special surgical work, and perhaps this training can best be obtained in the surgical clinic of a medical school. But can we as dentists all afford to neglect the field of work which opens to us all everywhere for those unusual opportunities of service which are grudgingly given and not often secured without collusion or superior fitness—a fitness acquired by special training and natural adaptability.

What man among us has not felt a commiseration and contempt for the medical man who has assumed knowledge (few do more than assume) of dentistry? I would like to ask you, this company, if you have ever received one helpful comment, one aid to practice, from a general practitioner? I do not ask from a spirit of antagonism; I am a graduate of medicine, a licensed practitioner in my state, a special lecturer in a medical college; but I am, and only claim to be, a dentist, and, however often I am called into consultation (and I would be glad for the patient's sake if it were oftener), it is for my special, my dental knowledge.

Amalgamation, generalization, is not as it seems to be in the business world—the keynote of process in the science and art of healing.

Is any man ashamed that he is a dentist? Let not his shame confuse his conscientious performance of his strictly dental duties to his patients; but if it *docs*, then rather let *him* be ashamed that he is not a man; let us be ashamed that he was ever called a dentist. Not failure, but low aim, is crime.

High aim is not personal preferment or local distinction, but to be and to do the very thing we claim to be and do as it can best be done.

Aspirations for medical recognition and associations cannot do for us what we can do if we well perfect ourselves in our special practice, and no badge of inferiority need be worn.

Your chairman could not close his report without restating what he has written and spoken in a different capacity, viz., a plan for the preliminary training of the dentist.

It rests with us, the mature thinkers, the teachers, the protectors, the fathers, the sponsors of dentistry, to say what shall be the training of the candidate for dental study.

The general educator, the medical man (whether he be dentist or not) has said that in order to enter his pupilage for a liberal profession he must have so many counts in Latin. Do you consider this sufficient? You know the boys that have made the best dentists. Was there not something in special aptness or training? Will you not say that a student should come to the study of dentistry with a fair knowledge of mechanics?

It is manifestly impossible for a boy to receive any stimulation to the cultivation of mechanical ability in the average preparatory school of to-day, during the years when motor development is best accomplished. This association, representing as it does in this branch and the central body the dental profession of America, stands sponsor to the race for the proper qualification of those who aspire to the practice of our specialty. The members of this association, though scattered over a broad expanse of territory, are in their communities influential, and if they will but agree in this council and at the

homes of its members on the following propositions, they will render a great service not only to the embryo dentist, but to their several communities:

First.—That it is essential that opportunity shall be given for motor training of youth;

Second.—That this motor training shall be so associated with academic training, both in preparatory and collegiate work, that students electing this course shall be at no disadvantage in obtaining their academic degree.

This training is essential to those who enter any pursuit where mechanics are involved, and not without use to any well-rounded human being.

Let us urge the introduction into our preparatory schools of manual training, where selection by those who propose to pursue some calling requiring mechanical ability.

B. HOLLY SMITH,
Chairman Committee on Education, etc.

DISCUSSION OF DR. SMITH'S PAPER.

Dr. Wms. Donnally, Richmond, Va.:—I am very grateful for the recognition of the chair. While I am very much interested in this subject, I have sometimes felt that this problem of dental education would not be solved in my day. I have changed my mind, however, in the last year or so. From recent discussions of this subject, I am inclined to think that the natural tendency of the dental profession is inevitably towards specializing, and when I hear such a paper from such a leader as Dr. Smith, my heart is rejoiced indeed that this question is to be settled by men, who are ready to take hold of it and determine it for the benefit of the profession. I do not think that I should go into the merits of the case, and give my views. Never having done anything in the teaching line, I prefer to leave it to those, who, like Dr. Smith, can speak from personal knowledge. I feel sure there are many today so doubtful of their position, and so doubtful of the position of the profession, that they long for medical recognition. I feel sorry for the man who has no part in the solution of the problem of the independence of the dental profession.

Dr. S. W. Foster, Atlanta:—I enjoyed the reading of this paper. I agree with Dr. Smith in most of his suggestions, but I must differ to a certain extent with some of his expressions. I believe that the tendency is too much towards specializing the dental profession today; too much towards specializing it from a technique standpoint. I appreciate the reasons why we are having these papers tending along this line. We are reminded that we are not recognized in European countries. We know they do not recognize the dental

degree in their schools, but make it subject to their medical degree, hence, they teach theory at the expense of technique. The International Association of dentists in Europe has brought about an influence largely changing the sentiment towards technique study as it pertains to dentistry. We are to have a meeting in Stockholm, where the American schools are to impress the importance of specializing dentistry, but let us not, in zeal, go to the extreme. I do not think that our education should be wholly theoretical, but I do think our position is dangerous, when we try to specialize too much towards technique. I recognize the fact we must have technique, but I believe many schools are devoting too much time to preparatory technique, at the sacrifice of investigation of the fundamental studies, chemistry, anatomy, and physiology, which underlie all medical science.

I refer you to the lecture of Dr. Brophy last night. A man could not do that who is only specialized in dental technique. We must have that learning of the fundamental principles of medicine, that will enable us to build up our profession. We cannot afford to eliminate this and put in too much technique. We must have chemistry, anatomy, and physiology. The tendency towards technique would lead the casual observer to think that a mechanic is all that is necessary to be an up-to-date dentist. I agree with you that it is best for the dental classes to be separated from the medical classes. I believe in sufficient technique to make expert operative dentists, but many do not get the underlying principles of our great profession.

Dr. J. P. Gray, Nashville:—I want to thank my friend for the paper, but, like Dr. Foster, I cannot agree with him in all of his expressions, and for fear some of the young men present might misunderstand the paper, I would call attention to the mechanical part of his address. I am sure he did not mean it in the terms he expressed. I believe there should be a thorough teaching of the fundamental principles underlying dentistry—chemistry, anatomy, and physiology. It is impossible for us to separate them. We could not teach anatomy perfectly by simply teaching the anatomy of the head, neck and throat. We cannot teach physiology properly by confining ourselves to the study of the teeth. Unless we study the principles of physiology, we are lost when it comes to the teeth. I believe the

colleges are awakening to the fact that it is important to give this thorough course in the underlying principles, before allowing the student to operate upon the patient. It is best that they be given the proper instruction in this line before allowing them to do operative work, and, if we stress too much the point of technique, I think it is on the wrong line. Our surgeons certainly would not teach practical surgery before teaching the principles, and I believe that it is best that we begin to teach the principles of chemistry, anatomy, and physiology before we teach the practical branches.

Dr. G. V. I. Brown, Milwaukee:—I wonder if all present appreciate fully the value of that paper. No one could have written such a paper, who had not given the subject a great deal of thought but I disagree with the essayist in some of his ideas. The paper is the product of too careful study of facts for us to undertake to argue against the paper—in this we all agree. The situation is just as he describes it, but I do not think the facts necessarily bear out the conclusion. It seems to me that we should take into consideration the fact that, when the Creator made man, he made him all in one, and therefore it seems useless for us to assert that dentistry is a branch of the healing art. The fact is, we are not a branch of that art, and for us to attempt to define the line of demarkation, between what we know and what the general practitioner should know, is difficult. The line is far from being clear. There is a certain amount of knowledge of the teeth necessary to the medical profession, but how is the medical man to know about these matters, if we do not teach him? How can we teach him unless he recognizes us as his equal in education? It seems to me that this has been the turn in the discussion of every paper before this body. The medical men do not understand these things as we do, therefore patients come to grief in excellent hands. We should invite them into our office to see us perform operations, teach him what the dentist does, and impress upon him the importance of leaving strictly dental operations for the dentist.

We should have sufficient technique to make us expert operators, but because that is true I fail to see why it is a disadvantage that we shall have the proper education, especially when it holds out so much inducement in placing us on a plane of equality to the man we propose to associate ourselves with in the medical profession. Give

the student as much education as you please in technique, but give him the proper idea of medical subjects.

Now, the danger lies here: Where our institutions are associated together, there are not many instances but where the power of management is in the hands of the medical men, and the dental student does not receive the proper consideration. He simply helps out the medical department. Let us impress upon the medical men the importance of this question, and endeavor to get the institutions to give the dental student that education, which he should have. If this cannot be done, let us divide ourselves. I believe, however, this can be done the other way.

Referring to my own personal experience; I attended a college where the medical and dental courses were given together. The dental students began their technique work immediately along with their other medical studies, and continued until their medical course was finished. The idea of dentistry was paramount. We are not of the idea that they were a profession we were to be ashamed of. It is not possible to make one branch greater than another. The man who has a medical degree, but who prefers to practice dentistry, is a great deal above the general practitioner. If there is any difference, it is in our favor. If we do not claim it, it is our own fault. We must educate the theoretical dentist to be fully equal to the medical man. When we have done this, they are equal.

In the American Medical Association it is a fact that the section on stomatology has the same courtesy as every other section. In the entire Association, less than 100 men will control the work of the Association. They will transact all the business, etc. There are about 3,000 or more members. They have a few from the dental section, as from other sections, and where we make our mistake is, that we do not claim what we are entitled to. If we would, they would give us all we were entitled to.

I would say, give equal power to the dental branches in these medical schools. Let it be understood that the dental department is to have all that is coming to them; that the dentist is a privileged individual in their institution, and that the dental student is to get such course as they should have, and not be made subservient to any other course.

Dr. Young:—This is a very serious subject with me. I feel myself

the lack of the proper education of the fundamental principles of medicine. There is no occupation you can follow, that can compare with the dentist. He must be an artist, surgeon, and mechanic. If I had a boy to educate to be a dentist, I would give him, first, his literary education, next, send him through the medical college, and then, qualify him to be a dentist. If we call ourselves scientific medical men, we must be educated on the fundamental principles of medicine, at least. The ordinary blacksmith has that dexterity which will enable him to manipulate technique work. If we are to call ourselves simple mechanics, this is all that is necessary.

Dr. Morgan:—I do not know that I know much about "Dental Education," but I have some strong convictions on certain points made by the gentlemen who have been discussing Dr. Smith's paper.

Some years a gentleman known to most of you, undertook to make a "Dentist" of me; he followed the course of Dr. Young. He sent me first to a "Medical College," and after I had graduated there, I was sent to a "Dental School," and in due course of time it was decided that I was entitled to a degree of "D. D. S." On my return home I told him he had made a mistake, that my "Dental Education" had begun at the wrong end.

I want to beg every man within the sound of my voice, who has a *son* to be educated in "Dentistry," *not to send him to a "Medical School"* first.

Throughout the discussion of the several papers which have preceded this, much criticism has been indulged in on the lack of knowledge on the part of "Medical men" on "Dental" subjects.

The *"medical profession"* is not and cannot be thoroughly posted in "Dentistry" any more than the dentists can be in medicine and wherever it is undertaken to educate the "Dental and Medical" students together, the "dental branches" are made subordinate to the "medical." "Dentistry" is *minified* and "medicine" *magnified.*

A boy thus taught, goes out with his degree, but soon finds he has gotten very little out of medical branches. I appeal to those here who have taken both courses, if it is not true. In the effort to grasp all, with no knowledge of what is needed, that the medical branches under these circumstances develop the theoretical instead of the practical dentist. There is not a teacher that is within the sound of

my voice that will not bear me out that the "Medical graduate" makes usually an unsatisfactory student.

Dr. Brown has said that this paper was the result of years of thought upon the subject; I think Dr. Smith has outlined the proper course to be pursued in the students preparation. It is the result of much study and thought and I indorse *in toto* the conclusions he has arrived at. Just a word of warning with reference to the lengthening of the course, it tends to two very objectionable conditions; one is to force the students to cut short his literary education and thus reduce the number who come to the "Dental College" with the literary degree.

How many of the students in the "Dental College" today have the "A. B." degree? About one out of every hundred. Increasing the educational requirement, if the student goes through with the "A. B." degree, brings him to the "Dental School" at an age at which manual dexterity *cannot be developed,* and I believe Dr. Mitchell will bear with me that this is the state of affairs on the other side of the water. By the time the students have passed through the gymnasium and entered the Dental Laboratories he has reached a period of life where he never can be expected to develop that manual dexterity that is essential to success to a dentist.

Dr. B. H. Teague, Aiken, S. C.:—I do not like to take up the time of the Association, but there are many young men here, who are going to be confused by this discussion. I have practiced dentistry for 30 years, and certainly have some experience. I attended a medical college for a short while before taking up the study of dentistry, and all through these 30 years this knowledge of medicine has done me a great deal of good. I give you experience, not theory. For many years after graduating in dentistry I recognized that it would have been a greater help to me had I taken the full course in medicine and become a graduate. How many students graduate from dental colleges who are fully versed in dosology? My experience teaches me that it is best that we should have a thorough knowledge of the fundamental principles of medicine as well as the technique of dentistry. I believe it is best for a man to take a full course in medicine with dentistry to enable him to practice properly, and to make him an equal with his medical brother.

It makes very little difference which one he takes first, but, to my mind, it is necessary for the dentist to be a medical man.

Dr. Young:—Dr. Smith, is it not a fact that the leaders of the dental profession are medically educated? I feel the loss of it myself, and I do not want others to be handicapped in the same way.

Dr. Morgan:—I will answer Dr. Young's question. The leaders of the profession are those that have never been inside of a medical institution. We talk about being equal to the medical man; I want to say that that man does not live, who does not practice medicine, who is the equal of the medical man. We could be equal if we would study after leaving school as the medical men do, but how many dentists keep up their study after leaving school?

Dr. W. H. Weaver, Lagrange, Ga.:—I have listened to the remarks made with very much interest. I have read, in the last five or six years, many discussions of this subject in the journals. I took it upon myself some time ago to write to the journals with regard to how many dentists read the journals. I have some figures that I am not at liberty to give, but I am safe in saying that there is not one dentist in twenty who reads one hour in twenty days. Let the medical man do the same thing, and God pity his patients. Leave off the study of your profession, and you must die, professionally. Those who are here study the profession. That is why you are here. But this is not true of the profession generally. Not over one-fourth of the dentists of the country attend society meetings, and I can say this does not represent the profession generally. There is about one in ten who subscribes for a dental journal. You can boast about American dentists, and we have some able men—the peers of any men on the face of the earth—but they do not represent the profession. If you wish to improve the dental profession, get the men of the profession to study. As a rule, the dentist's education stops as soon as he completes his college course and gets his diploma.

I am in favor of dentistry standing alone. I believe in its not being connected with medicine any further than this: that, when a man makes up his mind to study dentistry, let him make up his mind to be a hard student. Let him associate with the medical men, get ideas from them, study medical works that will help him along in his profession. All I know of the medical men who are dentists, is that

they have the M. D. degree. Teach the dentist to study, and study all the time, and the question is solved and solved eternally. Those men who discuss this question are all educated men. The question is, how to educate the profession in general. There is inspiration in seeing men work for the education of the profession as a whole, and it inspires the individual to higher things.

Dr. W. Mitchell, London:—I have listened with a great deal of interest to this paper. I most heartily endorse all my friend, Dr. Smith, has said. I met two gentlemen last summer that represent the leading element of the profession on both sides of the Atlantic—Dr. Brophy and Dr. Gordon—and if Dr. Smith had been with me, and heard their views, he could not have expressed them better.

What is the cause of this meeting of dentists? Go to the Medical Convention, how many dentists are there? How many medical men are here? The question has been asked: "Is it possible for a man to be a leader in the dental profession and not be a medical man?" The answer is, "Yes." There are a great many men who are worthy of the name of dentists—some of the old school—that never had the opportunity of a medical education, that are the leaders of the profession today. It only comes by practice. It would be necessary, of course, to have a medical education, to a certain extent, to enable a man to become an anaesthetist, but he does not necessarily need a full knowledge of medicine. The knowledge of the dental studies is more essential than the medical studies. In specializing, we could consider the fundamental principles of medicine, but we need not go into them to the extent that the medical man does. Take for instance the two branches of chemistry; we do not need as much organic chemistry as the medical man. We could simply touch upon those parts that are essential to dentistry, if we were to specialize dentistry. How many of the combination colleges pay any attention to the branches that are more essential to dentistry than medicine? There are many things necessary for medicine that are not necessary for dentistry. It takes from five to seven years to complete the medical course. After completing the A. M. degree, taking up the medical course, then, for a man to take up the study of dentistry, it carries a man beyond that age where finger manipulation can be developed to that extent that is needed in the operations he is called upon to perform. This must be taught

in youth instead of waiting until they are too old to learn manual dexterity. It is necessary that the dentist should be well grounded in the exact sciences. Let us have chemistry, physiology and anatomy, and those exact sciences that are necessary to the dentist. Let us have the fundamental principles well grounded, but let us have them along with the study of technical dentistry. Brophy, Ford, and Garretson are all better surgeons from being dentists. It is the idea in Europe that a medical education is not essential to the study of dentistry. We must listen to the leaders of our profession, Dr. Smith and others, that have degrees in both branches, and that have had considerable experience in teaching. We must respect the experience of these men. The results, as seen by them, is the production of this paper read here tonight. They see the uselessness of both medical and dental education in order to practice dentistry, and papers, such as Dr. Smith has just read, are the products of their reflections and experiences along these lines.

Dr. B. Holly Smith, Baltimore::—I have no disposition to further bore this body with the consideration of this subject. It seems almost inconceivable that Dr. Foster should have made the statement that I claimed that a man did not need a medical education in order to be a dentist, but in order to be a dentist must be purely a mechanic, but for the fact that Dr. Foster entertained a number of distinguished gentlemen at his house to-night. I claimed nothing of the kind: It was simply this, that the dental education could not be too broad. I would like to see every dentist educated in medicine, literature and theology, but would like to see their education carried out from a dental standpoint. I have been teaching for twenty years. I have from 200 to 250 students under me every year, and I can tell you those that will make the best dentists. From my experience, I appreciate the fact that this manipulative ability must be cultivated at a young age. Do not wait until a man goes through the medical colleges, literary colleges, etc., to teach him to use mechanical ability. He is then too old to develop that manual dexterity that is needed to perform the different operations he will be called upon to perform in his practice. This manipulative ability must be cultivated in the young years.

The subject was then passed and the meeting adjourned to meet again at 2:30 Thursday afternoon.

THIRD DAY—AFTERNOON SESSION.

Meeting called to order by Vice-President, Dr. L. G. Noel, at 2:30 o'clock.

The Committee on Pathology, Materia Medica and Therapeutics being called upon for report, Dr. Geo. S. Vann, Chairman, Gadsden, Ala., submitted the following report:

Since the last meeting of the Southern branch in July, there have been recorded no conspicuous discoveries or developments, within the province of Materia Medica and Therapeutics, but your committee would call attention to Chloretone, which is claimed to be a mild local anesthetic having no deleterious effect upon the heart's action, and possessing considerable antiseptic properties. Also Adrenalin, which is one of the best hemostatics on the market, and in Oral Surgery has been found to act promptly in checking hemorrhage from the gums or that following nerve extirpation.

In reviewing the subject of Pathology we find an interesting description of the pathological processes in an unerupted tooth by W. D. Miller of Berlin, a case illustrating plainly how easily "discoloration, due solely to dried blood with which the cavities became filled during extraction, might be mistaken (without careful investigation) for caries of an unerupted tooth, thus leading to false views concerning tooth caries."

Another valuable paper under this head is one of almost revolutionary character on "Pyorrhea Alveolaris with Special Reference to Practical Medicine" by Dr. William Baldwin Keyes, London, appearing in the Dental Cosmos for January, 1902, in which he sets forth that the tendency of most modern thought is to show that so far from gout and rheumatism being the cause of pyorrhea alveolaris, they are often the effect; and that these general systemic affections, and many stomach troubles are the direct result of the chronic poisoning of the tissues of the patient by the toxins of pus produced by the disease in the mouth. These statements corroborate a prophecy made as far back as 1873, by our esteemed friend, Dr. J. Y. Crawford, at which time he asserted that "medical practitioners would never be able to combat, successfully, the phenomena of disease in the human system until they recognized the importance of the condition of the oral cavity."

In the way of original matter for the present meeting your committee begs leave to submit the following papers.

Dr. Geo. S. Vann, Gadsden, Ala., then read a paper on

APATHY IN THE DENTAL PROFESSION.

The reviewer, who has spent the greater part of the past few years in setting forth the progress of the nineteenth century, and praising its marvelous achievements, would do well to remember that every century of the past has been regarded as a wonderful era when compared with its predecessors; that the achievement of each succeeding one is only made possible by all that have gone before; and that no great character, or event in history stands alone, each being the product of a thousand contributing influences. Consequently, if we would form an unbiased judgment of the attainments, present status, and future of dentistry, which known as a profession, is the offspring of the nineteenth century, we must review the preceding periods and study their bearings upon its development.

That Dentistry is to some extent an ancient art cannot be questioned, but so barren of practical value are authentic references to the remote past, so chill the night of that age when barbarous hordes from the East overran the lands of culture and civilization enshrouding learning, science and the Arts within its pall of ignorance and superstition that it is an almost fruitless effort to trace the faint thread of its existance until we emerge from the darkness of the Middle Ages through the triumphal arch of the fifteenth century into the light of modern times.

Thus the *fifteenth* century, characterized as it was by a general awakening of the European mind from the lethargy of the Dark Ages, stands at the beginning of a new order of things, and becomes the first period of a cycle of unprecedented progress. During its earlier years new life and energy were infused into every department of human thought and enterprise, and the scattered treasures of preceding ages were gathered up and utilized as a foundation for modern civilization. By the *middle* of the century, gun-powder, the printing press and mariner's compass were contributed to the world's material advancement; and towards its close the progressive portions of civilized humanity were pushing towards the western limits of Europe, in direction of that "continent of the future,"

which discovered in the last decade came just in time to aid in the new growth of ideas, moral, intellectual and scientific, by offering a new world for their development free from the superstition, bigotry and intolerance of the old.

But, however remarkable the progress of the fifteenth century, it was along material lines; its energies were concentrated upon matter rather than man, giving him hitherto unknown continents for civilization, but accomplishing little for him as a moral and social being. Therefore, that man might remain master of the situation, the *sixteenth* century turned upon the pivot of human interest, developing the individual through the religious upheaval known as the Reformation, upon the emotional or moral side. During the *seventeenth* century so general was the dissemination of knowledge that the people became sensible of their intellectual powers and of their needs and rights as men. This consciousness found expression during the *eighteenth* century in a popular demand for civil and religious freedom, culminating in the liberation of the American colonies and their union under a Republican form of government. The cycle of dominant individualism being now complete by the development of the moral, intelectual and executive faculties of man, and the increased powers of the individual being concentrated upon the conquest and betterment of his environments the race is prepared for the appreciation of, and to be partakers in the organization of that profession which harmonizes in its being the progressive trinity of science, art, and the mechanics, the latter in its artistic perfection being the practical expression of scientific principles and theories relating to the treatment of the oral cavity and adjacent parts. That Americanism, which is regarded as the highest type of the new order of things, might have the proper material for the development of the Dental profession, history now repeats itself by returning to the material plane of the *fifteenth* century, which is *evidenced* by unprecedented geographical discoveries, great inventions and territorial expansion. The spirit of industrialism and commercialism has dominated all the activities of the century and as a result we have enormously increased capital and production, the concentration of large masses of people in cities, and the growth of social, commercial, religious and labor organizations. Thus the *nineteenth* century has prepared the *material* way for the social reorganization of

the *race,* as the fifteenth did for the uplifting of the *individual.* In this new cycle of progress what is to be the mission of the twentieth century? Present conditions and the orderly sequence of history lead us to believe that it will be the parallel of the sixteenth; that human interests will prevail over material development, that emotional activity will expand into aesthetic and ethical life, and economic thought be directed chiefly, not to wealth production, but to wealth distribution for the uplift and wellbeing of mankind.

Therefore the passing of the nineteenth century and the dawning of the twentieth presages much to the student of affairs interested in the ethical and sociological progress of the *Dental* Profession; how *much,* depends upon the capacity and powers of the present membership to address themselves to the problems developed by the industrialism of the past century, which are already pressing for solution.

Happily time and memory travel in opposite directions and it is our privilege to-day to review the unforgotten past of modern Dentistry, catch its spirit and learn its lessons, thereby *preparing* ourselves for a better performance of the duty which lies nearest us, an intelligent progress in the new century, and gaining a nobler conception of our inheritance as a profession.

Now in order that we may apprehend more fully the *material* difficulties of the pioneer period, and by contrast show how great a debt of gratitude we owe the fathers of the Dental Profession, imagine the operator of to-day divested of all modern appliances and methods, empty his cabinet of its array of instruments and late preparations of gold, take away the rubber-dam, remove his electrical appliances, obliterate his knowledge of anesthesia, of pathological conditions, of bacteriological investigation, and all ideas of fermentation, sepsis and asepsis, which together with the elimination of educational and associational features leaves him alone and barehanded, enveloped in an atmosphere of suspicion and indifference, laboring behind closed doors to forge out as best he can the *tools* necessary for his work.

But this condition of affairs was the hour of deepest gloom that precedes the dawn, toward which a *few* men, before whose vision had arisen the future possibilities of an organized profession, turned their faces. With the coming day there was much to be done, so

contradicting the negative attitude of their forerunners and contemporaries, they put into practice the golden rule of life, and lo! it became a creative force, generating fraternal feeling and elaborating itself into a written code to which all could subscribe. It drew men together in societies, unlocking their laboratories and teaching them that upon mutual aid and reliance rested the future of Dentistry; enlisted the sympathy and energy of those capacitated to write books and publish magazines in the interest of dental science and art; and inspired philanthropic ideas which enabled them to establish colleges with scientific and technical training for young men. These halls of learning are to-day the fitting memorials of noble lives of sacrifice, in comparison with which a Trojan's column or Hadrian's Mausoleum seem monuments of self advertisements.

These early promoters of dental civilization labored faithfully and ceaselessly during the first twenty-five years, their difficulties and failures suggesting new methods of practice. Then as a reward of genius, patient industry and skill, came almost within a year the material contributions of the rubber-dam, the dental engine, the cements, improved disks, the mallet, and cohesive gold. Colleges next were endowed, literature broadened and Dentistry was enrolled among the learned professions.

All this and more was accomplished within the span of a lifetime, and a profession preeminent for scientific discoveries and mechanical invention, united in local, state and national association, with an educational center in almost every state in the union, and a literature second to none among the learned aristocracies is the rich and unspeakable legacy of our fathers to the rising generation, with which to buy up the opportunities of the present, and future; requiring on *our* part strength and rectitude of character, minds well-trained and stored with knowledge of the arts and sciences relating to practice, skill in the performance of all operations and constructions, and a readiness to defend and advance the honor of the profession at every point.

Confronted by this proposition the question naturally arises in the mind of every American Dentist, "Do I measure up to this standard?" "Am I equal to the emergency, or shall I, like the prodigal son, waste this great inheritance in a riotous manner?"

Leaving each one to a thorough self-examination before making

answer, let us consider some of the influences and elements which go to make up the present professional status, to the issues of which the dentists of the twentieth century must give themselves, if they maintain and advance the standard.

The first aspect of the situation with which we must familiarize ourselves is present environment, and in its relation to the profession we must take the world as we find it. We must remember that the nineteenth century was eminent above all preceding ones for mechanical and industrial evolution and that therefore, the tendency naturally is from the ideal to the practical, from the development of the ethical to that of the commercial spirit, from the individual as a laborer in a world-wide field to a monopoly of the world's products depending upon machinery and organized labor. That the energies of these combinations, both capital and labor, are directed toward the accumulation of wealth, overturning in their mad rush after the "almighty dollar" the business customs of the past and setting up in their stead sharp and scientific competition. As an outgrowth of this general condition there is a disposition on the part of the people to demand quick and large return for the least possible effort; and as the employments of the lower classes gradually approach, by reason of their relation to progress, to the dignity and influence of the professions, the idea so seductive to those accustomed to manual labor, is suggested, of substituting head-work for hand-work, conceiving it to be the more honorable, the less arduous and a quicker way of making money. Hence we see the professional ranks crowded, by an overwhelming majority too, with recruits from the laboring classes, bringing in perforce an atmosphere of materialism, trade and competition altogether foreign to the professional spirit, which depressed and aggravated by the petty jealousies and trials of every-day life, degenerates in most instances, into a chronic state of apathy with respect to the principles and practice of ethical reciprocity. This condition assumes dread proportions since we know that all enthusiasm concerning higher and nobler things, all professional progress in the right direction depends upon ethical culture and surroundings, and that the lack of it, is the first step downward from the present high plane to the business strata.

Nor is cause for anxiety diminished when we further see this

commercial influence organizing its forces within the province of the professions in order to take advantage of the individual worker. Allusion is had here to the tendency already established in business circles "of organizing activities along economical lines." Of course, says a thoughtful writer, "as long as it is necessary that professional work be personal, and not subject to the competition of machines, just so long will it be impossible to completely crush out competition in law, medicine or dentistry," but there is already such a thing as the "combination of lawyers, doctors and dentists," so that "by the division of labor" and "economy in fixed expenses," prices can be proportionately lowered so as to attract the public and yet increase the dividends of companies.

This force has been felt in all of the professions illustrated by the trust companies in law, who employ men willing to pawn their diplomas for a fixed salary, in return for which they perform the menial services of collector, and scrub advocate; the multiplied Sanitariums, private hospitals and medicine companies of the mushroom type with which the physicians have to contend; and a system of organized and legalized quackery in Dentistry, which reaches its fullest attainments in the "dental parlors' and "emporiums" of our streets and avenues, in which ethics play no part, and the chief and only object is to *make money,* by all the devices of trade, the main dependence being *advertising* and underselling your neighbor.

Now since it has been shown that this hydra-headed element of abnormal numerical force, and the organization of its excess exists in the Dental profession, it should be further recognized as the most demoralizing factor in professional life. Dentistry from its very nature, having less of the purely personal element and more of the mechanical, is peculiarly susceptible to business influences and methods, and in large cities where organization and competition are most active, the animating spirit of the profession is dejected and the financial returns for meritorious services rapidly on the decrease.

Therefore no practitioner will fulfill his professional obligations who does not interest himself in the young men of his jurisdiction who contemplate studying Dentistry, discouraging those whom he clearly sees are unworthy and incapable, and encouraging the skillful and industrious, and living so that his example will be an ethical

guide. He should also counsel with the student in regard to his educational plans, advising him to go where such high ideals of honor and right living are inculcated in the prospective graduate, *that* will not only eliminate as far as possible, all undesirable qualities, but enable him to resist the temptations of commercialism in shaping his future policy.

This brings us with the candidate to the college portal of his respective choice, and may we not congratulate ourselves when we recall the action of the National Association of College Faculties at Milwaukee, whereby was added another years' course to the three already required, may we not congratulate ourselves I repeat, that these institutions of learning, equipped with every modern appliance and manned by a corps of distinguished educators, stand like fortified castles of old at the entrance of the profession, guarding its interests? May we not rely upon the preliminary examinations of such institutions to be selective in quality, directing every energy toward discriminating with respect to the prerequisite training of candidates, their fitness and love for professionalism? May we not also believe that the environment of student life while within their walls, will be pure, clean and ethical? that the restraints thrown about them will be conducive to study, to the formation of good habits and to the conservation of their time, money and energies? Discipline of this nature *will* bear fruit in the lives of men, and do more to overcome the spirit of commercialism and competition, than any other force. And when a year's *technical* training is required as a further test of personal fitness for matriculation, and a chair of Dental History and Ethics has been established, the seeds for the development of a nobler strain of professional life will have been sown during the collegiate course. In the meantime it should be the privilege and pleasure of the profession at *large* to support and encourage the National Association of College Faculties in every good word and work, for they can never without impairment of their practical efficiency be either far in advance, or far behind the period and profession to whose educational needs they minister.

Unfortunately it is impossible to appeal to the profession as one grand and united body along any particular line, because of the several factions into which it is divided, which arrange themselves into three classes; the truly professional body, who have complied

with the law and organized themselves for the purpose of supporting it at every point, and of advancing the interests of the profession, secondly, that class, which having complied with the letter of the law, studies to evade it, and the third class, usually known as quacks who are unable to appear before the board for lack of preparation, and practice in open defiance of the law. His schemes for accomplishing this are many. Generally he uses some licensed practitioner's office as head-quarters, and enters into league with the court officials by a promise to do the family practice gratis, which arrangement entitles him to all the rights and privileges of the district. Now having mapped out his course he makes up his pack which consists of sundry articles, together with his gun, dog and fishing tackle, and the journey is begun. His dates having been advertised ahead and noised abroad, the neighborhoods are anxiously looking forward to the coming of the genial tooth carpenter, who on his arrival perceives he is in luck and proceeds to business. Having nothing invested he feels at perfect liberty to make agreeable terms with all applicants, and in case he works for the entire family he takes it by the job, making sure of all the cash he can get, the rest in barter. In his selection of filling material he leans to the plastics, finding it difficult to live up to the gold standard, is blissfully unconscious of the treatment of pulpless teeth, and is usually successful in the long run of clearing his patient's mouth for a complete set "of chiny." This manner of practice he continues, alternating his operations with hunting and fishing expeditions until he makes his entire rounds. Then begins "the retrograde movement" gathering up his barter here and there on his way to market.

Little as you may think this kind of business has a most depleting effect throughout his section of the country, inasmuch as he through ignorance establishes a misconception concerning the nature and value of dental operations, and produces a prejudice in the minds of a great many good people by denominating the truly ethical man an extortioner.

But this phase of practice would not necessarily give rise to any great degree of anxiety, were it not for the over-crowded condition of the profession and the organization of its superfluous members, which gives rise to the second class referred to above, who having made suitable proficiency and complied with the letter of the

law, establish themselves within our very gates. The situation which here presents itself is one over which we may well stop to ponder, since the education of the public does not keep pace with the large number of graduates that annually file into the profession. This inequality of supply and demand necessarily brings about a decline in the average fee, telling in its effect upon the moderate circumstances of the majority of the dentists in the United States, any deviation from whose income is more or less embarrassing. We apprehend also, that most students have well-nigh exhausted their resources during their college course, and in many instances have even borrowed the funds with which to meet the emergency, hence necessity forces them to realize something at once from their own efforts. Having located in a good town, which however, is full of dentists, in fact, it seemed impossible to find a place where the demands were not already fully supplied, the next point is how to gain a practice. In the average young person's soul there is a responsiveness to ethical training and influences, and in the beginning of his active professional life he desires to align himself with its best interests. If he has moral stamina and worldly foresight, he will realize that honesty, sobriety and application, will surely bring their reward and meet with success by and by. But the temptations to stray from the "path of professional rectitude" are strong and numerous, and the young practitioner who hangs out his sign and ethically waits for a practice that is proverbially slow in materializing, may grow more despondent day by day until in his extremity, he resorts to trade methods fondly hoping to return to the professional fold later on; or he may accept an alluring offer from some Dental Parlor, gratefully preferring a fixed salary to manfully facing the expenses and responsibilities of an individual career.

When this deviation in the course of a young man's life is observed, we question whether he is morally sound, or if earlier unethical surrroundings are responsible for the propensity, or perhaps the plan on which many College infirmaries are conducted may first appeal to his commercial instinct, and suggest the idea of reducing prices as an inducement to obtain patronage, thus paving the way for this step, which is taken more and more frequently by the recent graduate and accounts largely for the increase and growth

of quack establishments. However this may be, the result is the same, the young manhood of the profession is being dwarfed, and vital capacity for growth as a body is curtailed to the same degree.

And now to each intelligent practitioner, I would propound the question, "Is this departure on the part of the young men from the well-beaten paths of our predecessors calculated to undermine a practice built up by years of unceasing toil and labor along ethical lines?" "No, if we could but hope that these professional renegades would some day be reclaimed; but on the contrary their tendency is usually downward until they voluntarily drop out of professional circles, and reflect upon their Alma Mater by advertising in a most promiscuous manner.

A peculiar characteristic of the American people is, a desire to get the best and most for the least money, and hence they are attracted by the advertising dentist to make investigations, and he, appreciating the situation, readily explains that times have changed, and that just in proportion as work is facilitated by new appliances and improvements, is the dentist under obligation to the people to reduce his fees for services rendered.

The ethical man, forgetful that present economic problems are the natural and logical results of industrial activities, which if bravely met and worked out will lay the material foundation for the social development of the profession, ponders in his leisure hours the fact that so many of his patients have been lost to him by virtue of commercial inducements thrown out, and in many instances he grows pessimistic, declaring that the profession is doomed. Under these circumstances it is easy for him to reconcile to himself the uselessness of either attending dental societies or serving in any capacity that tends toward organization, rather preferring to remain at home and guard his own interests. Just *here* you may lay your finger upon the heart of apathy in the dental profession, which has actually become a contagion, confining itself to no locality, but prevailing throughout the entire country.

This fact is to be greatly deplored, and an energetic movement in favor of local organization should be inaugurated at once which would not only largely counteract its morbid tendency, and overcome the inertia so apparent everywhere, but engender brotherly love and confidence among the professional men of the community,

unite them upon some feasible plan to defeat this shopping disposition among the people, and prepare them by contact and systematic study to keep well in advance of the public mind and at the same time devise ways and means for educating it to a higher appreciation of the true mission of Dentistry. As a practical illustration of local organizations, consider the efficiency of the ministers "Monday Morning Conference," the county medical societies, the various trade and labor unions, to unite their common interests and materially improve their condition. Personally I have seen all these different orders successfully carrying out their plans, and in Alabama the dentist is the only man who is willing to conduct his own affairs without regard to associational helps. Permit me to ask how many cities to say nothing of the towns, within the limits of this Association have local societies? Gentlemen, when we consider how small is the percentage of organized force in the profession, and how heedless we have been with respect to this question, is it any wonder that we suffer from apathy?

We as a profession have kept step with the mechanical activities of the nineteenth century, as is witnessed by the elegantly appointed and perfectly equipped modern dental offices; but if we would still march in the vanguard of progress, these surroundings must become only the material prototype of the spiritual development of the twentieth century during which the study of man will be more highly esteemed than matter, and the ethical adjustment of his relations, through social and economic organization, of profounder moment than the mechanical adjustment of material means and ends for his gratification and convenience.

Hence the spirit of the times invites us to-day, to the undertaking of two great projects, fraught with vital possibilities to the Dental Profession—the thorough organization of its forces, and the education of the people. And *we,* assembled here in convention, should not lose this opportunity of bringing forward plans for the dissemination of dental information among the people, for the appreciation of which the public school and other systems are preparing the rising generation; and, further, we should become partakers in the development of the associated life of the future, by taking direct steps toward *local* organization, qualified representation from which so-

cieties would tend to promote the intelligent growth of this body, and of the National Association.

Dr. J. Y. Crawford, Nashville:—I have made no special preparation for the discussion of this paper. I wish to thank the gentleman for the very properly and well prepared paper. The latter part of the paper called attention to some very significant questions, that suggest themselves to our mind at this time.

While my life has been largely made up of optimistic views, and has been more inclined to optimism than otherwise, yet I am inclined to think we should give some consideration to the pessimistic side of the question. One of the strangest things to me that I have ever thought upon, is for an individual, that expects to engage in a vocation that has for its object the advancement of the human race, does not give more consideration to the moral and intellectual side of the question. If he expects to be brought in contact with a learned profession, these qualities should be paramount over all other considerations. One of the principal points in the paper, that impressed me very much, was the question of preliminary qualifications in entering upon the college course of study. I have longed to see the time in dental surgery when the line of demarkation between bad and good would be passed. Others here will agree with me when I say that we have seen the time when a great many of the men, who were engaged in the practice of dentistry, were doing more harm than good. I am glad to say that I have lived in a time when we have crossed the line of demarkation, and the dental surgeons are doing more good than harm. I hope to live long enough to see the time when our institutions shall not only require a good preliminary education, but shall require the applicant to undergo a physical examination touching upon his qualification to become a dental surgeon. The lowest department of the governmental service cannot be engaged in until the applicant has passed his physical examination. The idea is not to get men who are imperfect, men who have incurable diseases; but good men, men who have a moral, intellectual and physical character, having no elements of perversion marking them.

Dr. J. E. Chace, Ocala, Fla.:—I would like to thank Dr. Vann for his thoroughly prepared paper. It strikes me as a very important study along psychological lines. I shall look forward with pleasure to

seeing his paper in print. There are many good ideas with regard to our profession.

Dr. M. F. Finley, Washington:—I would like to say one or two things. I wish to thank Dr. Vann for the ideas he has expressed and to acknowledge my appreciation of his paper. I am fully in accord with what Dr. Crawford has said. My idea is to do something in the line of ethics which will influence the student before entering the profession, and which will maintain its hold upon him throughout his career. In the college course, to impress upon him the necessity of living in accordance with the ethics of the profession. It occurs to me that we could demand of a student, on entering college, as much as is demanded of an applicant for membership in a secret society. We could require of him an obligation to live an ethical life after leaving school. More effect could be had on that line, when he is entering his college career, than after he has once gotten into the ranks of the profession, and has gone in the wrong direction. I have read some articles in the journals on this subject in which the claim was made in which the burden of properly controlling the individual in the profession lies on the Societies, whereas, I think, it rests with the colleges. The colleges might insert a clause in their diplomas which would make the validity of them conditional upon the possessors of such diplomas conforming strictly to the code of ethics.

Dr. J. J. Sarrazin, New Orleans:—I am glad to see Dr. Finley take the position he does, and I think his idea is not only a possible one, but quite a practical one. I am glad to say that this idea has occured to us down in the South, and, I should say, in the City of Atlanta, of making graduation of a candidate conditional upon his subscribing to the code of ethics, and constantly bringing before him the importance of making him live up to it. It is not a new idea, and, as I said above, it is possible and practical. This impression should be made early in the day. A strong impression made upon the young mind is much more lasting than it would be later in life. I think it would be a good idea, if we could make this a general custom throughout the entire country; making the signing of the code of ethics a condition of the diploma, and keeping it constantly in the minds of the students. Insert such a clause in the diploma that, when seen in after life, it would show that the holder is a

traitor instead of trying to live as an honorable individual; if he be not ethical.

Dr. Wm. Crenshaw, Atlanta:—It would be a difficult matter to elaborate upon anything the essayist has said in his paper. The remarks made upon it are valuable, and appreciated by us all. I concur most fully in Dr. Finley's suggestions, and wish they could be carried out. I am glad to see the teaching institutions in the South following the suggestions made by Atlanta. I have the honor to have inaugurated the signing of the code of ethics before the student can graduate. The idea originated with me, so far as I know. It is my fond and anxious desire to have them remain ethical after graduation. So far as we can make it imperative, we have done so. I sincerely wish no man would come forward for graduation, who does not mean to live up to the code of ethics. There is more in the maintenance of the profession that we think. After studying the question carefully, you must decide that it is of extreme importance to stick closely to the code. I am sure I voice the sentiment of this assemblage, when I say that we are very greatly indebted to Dr. Vann for his valuable paper.

Dr. W. O. Tolbot, Biloxi, Miss.:—I heartily concur with the gentlemen who have just spoken. I wish to endorse the suggestion of Dr. Finley in regard to signing the code of ethics before a man is allowed to graduate, also inserting an oath in the diplomas that he would be required to sign. I do not think the oath could be made too strong. I also think it would be a good idea to insert a clause in the catalog of the colleges, announcing that the applicant for graduation would be required to sign the code of ethics, and to make an oath that he would live up to it. He would know then what he was to sign before entering. I think all institutions have the right to insert such a clause in their diplomas.

Dr. A. M. Jackson, Milledgeville, Ga.:—I think these suggestions very good. Signing an oath does not bind a rascal. Incorporate a clause in the diploma to the effect that the legality of the diploma depended upon their living up to the code of ethics. I believe the colleges have a perfect right to insert such a clause. Such a diploma would reflect dishonor continually, should the holder attempt "quackey."

Dr. Young:—I understood the paper to be on Apathy in the

Dental Profession. Apathy means indifference, carelessness. I think there is no profession under the sun that has the energy and determination to come to the front as the dental profession. There is no occupation since the Pharos that has made such advancement. I do not think for a moment that we are sleeping over our rights. As soon as a man becomes a dentist, it seems to stimulate him, and makes him more and more a gentleman. The dental office of today is a revelation. We find in an up-to-date dental office a clean laboratory, improved instruments, and a gentleman at the chair. I say we are destined to rise.

You cannot legislate morality into a man. When a man enters a profession, if he does not conduct himself as an honorable, moral citizen, he will not be a success. If it is not born into him, you cannot legislate it into him. So far as the morality is concerned, I do not believe there is a purer and cleaner profession than dentistry. I say the profession, as a whole, has conducted itself in such a manner as to place it above suspicion. Many ladies go into dentists' offices up stairs after dark. We see this every day. How can you account for this? Simply because the dentist is a gentleman, and stands above reproach.

Dr. W. R. Bogle, Nashville, Tenn.:—I thank the gentleman very much for the paper. His suggestion with regard to inducing the young men of the profession to come into the Societies is a good one. Get them to come in with us, and work with us in our Associations in order to get some good out of it. Let them feel that the profession has an interest in them. It may be that, at times, they do not feel able to attend these meetings; we should get them to send in their names for membership, and contribute articles to the society. I think we could do a good work along this line.

Dr. Vann:—Some years ago Dr. Brown, of this City, delivered a lecture at our Montgomery meeting of our State Society. I have forgotten his subject, but his theme was, what shall we do to improve the attendance of our State Societies. I enjoyed the lecture very much, went home and continued to think about it. At the next meeting of the State Society, I heard the same cry. It seemed to came from every State, until finally the subject of apathy was suggested to my mind with respect to the associational work of the profession.

It is the rule that history repeats itself, and let us recapitulate for a moment. I brought out the point in the paper that the fifteenth century advancement was along material lines; the sixteenth, development along religious and moral lines; the seventeenth, along intellectual lines, and the eighteenth, along the line of executive ability. The nineteenth then completed the cycle, and returned again to the material views of life. So we are now in the beginning of the twentieth century, and we must naturally look to education along religious and moral lines. Beautiful illustration of the fact that the nineteenth century has prepared the way for the social reorganization of the race, and that the individual will be developed as a member of society, is seen in the donations Mr. Carnegie has made for the purpose of establishing libraries for educating the public. I have also noticed recently that Mr. Rockefeller is becoming interested in the education of Southern people. This only shows the natural tendency to follow the cycle.

I am very much gratified to see that my friend from Anniston is so sanguine with respect to the future of dentistry. He takes the optimistic view of the present condition. I think his definition of apathy is quite correct. If he will think for a moment, though, he will readily see that the development of the last century was largely along material lines. If we have not apathy in the profession, our President is very much mistaken in his annual address. He called attention to the fact that the Georgia Dental Society at the last meeting was about the same in membership as it was fourteen or fifteen years ago. That is what I call apathy. He spoke principally with respect to Georgia, but what is true of Georgia is true of all the other Southern States. Only about half of the dental profession is represented at these Societies. It is my opinion that we can do a great work personally along this line, if we will go back home and talk about the good things received at the Association, and encourage our brothers to come out and become members. Let us also go back home and edify the people, and enlighten our patients, with regard to the good we get from our Societies. I say, we do have apathy along these lines, and it is time we were awakening, and using our every effort to educate the people along moral and intellectual lines. I certainly thank you all for what you have said with respect to the paper.

On motion the subject was passed.

Dr. Turner, Chairman of the Executive Committee, presented the names of Dr. R. B. Adair, of Atlanta, Ga., and Dr. M. E. Turner, of Atlanta, Ga., for membership to the Society.

The following resolution with regard to the condition of the dental surgeons in the army and navy, was introduced by Dr. V. E. Turner, Raleigh, N. C.

Resolved, That it is the sense of the Southern Branch of the National Dental Association that the enlistment of dental surgeons by the Navy Department to menial positions and detailing them to do professional service is inconsistent with the character and value of the service required, and an inconsiderate disregard of the status which is accorded the dental profession by the state laws, by the state universities and other educational institutions, by the public of this and foreign countries, and by the act of Congress creating an Army Dental Surgeon Corps, whose members are equal in professional status with two-thirds of the members of the medical corps of the army; and,

Further; that the adoption of the pending bill on the subject, Senate 2519, is the least that should be done to remedy the wrong against which the dental profession is thus forced to protest.

Dr. Wms. Donnally, Washington, D. C., was asked to explain the existing conditions, and to inform the Convention as to what progress had been made to better the conditions of the dentists in the army and navy.

Dr. Donnally:—Being called upon to make some explanation of the conditions that justify this Association in making such earnest protest against the action of the Navy Department in employing dentists in the capacity of yeomen, and detailing them to do dental service, in the beginning will say that, for many years the question was not agitated by the dental profession, seeming to be indicative of the indifference of our profession in claiming recognition in the Navy. But this seeming indifference was dispelled, and an interest was awakened, and at the meeting of the National, at Omaha, a Committee was appointed to take under consideration the conditions prevailing in the Army and Navy, and make recommendations at the next meeting. The Committee reported at the Niagara meeting, recommending in substance that we make a particular effort to go before Congress with a bill on the subject. The report received consideration at the hands of a Committee, and they reported, recommending a continuance of the original Committee with instructions to use every effort towards having a bill passed by Congress to im-

prove the status of the dental surgeons, and putting them in the Army on the same basis as the contract surgeons, who constituted a large majority of the medical corps of the Army. The Surgeon General opposed this, but after very great effort the bill was passed, and became a law. The bill was fathered in the Senate by Senator Pettus, of Alabama, who was instrumental in getting it through the Senate. Some months later Hon. Hardy, of Virginia, took up the bill, carried it through the House, and it is now a law. Those dentists, who constitute that corps, are on a par with the contract surgeons, who compose something like five-sevenths of the corps.

The conditions in the Navy are entirely different. There is no contract system there. The Navy is a little more severe than the Army, and your Committee had an interview with the medical officers of the Navy with regard to improving the status of the dental surgeon in the Navy, but we were prevailed upon to make no active effort in view of the fact that legislation on the subject was pending, and that any action on our part might interfere with the legislation, promising to aid us later on. We were informed that the legislation had for its object the improvement of the status of the Medical Profession in the Navy. The status was not sufficient to warrant the better class to come into the Navy. Promise of promotion was not such as to induce them to come in. The bill was approved by the Secretary of the Navy, and improved status was gained. After the medical officers obtained what they had asked for they refused to help us with our legislation. Upon investigation into the conditions, we found that they were employing dentists as yeomen, detailing them to do dental service under conditions that would mean something like $40 or $60 per month. It then became necessary for us, in defense of the honor of the profession, to ask Congress to pass a bill that would improve the status of the dental surgeon, and that would give us such recognition as is given by the general public; such as is given by people of foreign countries to American dentists; such as is given by the Universities, and other educational institutions of the country. We took the position that it was necessary for us to ask of Congress that which had been denied us, and to right the wrong that had been voluntarily heaped upon us by the medical officers, after getting what they asked for.

I will give you one simple illustration of the effect of the existing

conditions: Two young men enter the University together, one enters the Medical Department, the other the Dental Department; they go along together, practically having the same teachers for the first two years; then they separate for the practice of that particular branch which he is to follow. They get out, one eligible to maintain status in the Navy with the right of promotion through six different grades, and many attain fourth and fifth grades, after having been in for a few years; the other eligible to become a yeoman. The dentist is not permitted, under the rules of the department, to enter that part of the vessel in which the Commissioned Officers are quartered, except on special business; in that case they enter; salute; state their business; salute; and return to lower deck. This condition of affairs receives the approval of the Government. It goes out into the world, and every young man, who enters the dental profession with the intention of going into the Navy, when he learns that this condition exists, will proceed to change his mind, and enter the medical profession. I think the least we could do would be to adopt this resolution, and urge every man, who has a Representative in Congress, to use his efforts to get him to support a bill that will give us simple justice.

Dr. Sarrazin:—The resolution in question has already been adopted. I think we all feel very grateful to Dr. Donnally for what he has done as one of the Committee. It seems to me, though, that we might do something that would give greater weight in Washington than the simple signature of the officers to the resolutions. I would suggest that each member of the Association sign the resolutions, indicating the State he is from, showing that it has the approval of an Association that is representative in this country.

Dr. R. C. Young, Anniston, Ala.:—I wish to state this fact, that General Pettus, of Alabama, was the main leader in getting this bill through Congress. I know personally this knight of the lost cause. He is a grand old man, who has grown hoary in the service of Alabama, and the man we are indebted to for making the Government recognize the Dentist as a man of ability. I think it would be a good idea to pass resolutions of thanks for his efforts in the past, and request that he continue them in behalf of improving the status of the Dental Surgeon in the Navy. I wish to make the following motion:

"That the Secretary be instructed to transmit the resolutions relating to the Navy Dental Surgeon bill to the Hon. E. W. Pettus, with the request that he continue to pursue the object to a successful conclusion, and to suitably express the high appreciation of this Association of the important service he has rendered in securing to the Army the benefits of the service of a Dental Surgeon Corps."

Motion passed.

The Executive Committee submitted the following names for membership: Dr. Thomas Crenshaw, Atlanta, Ga.; Dr. H. J. Pratt, Atlanta, Ga.

Report from the Committee on Orthodontia and Oral Surgery, Dr. W. E. Walker, Chairman, Pass Christian, Miss., was read by the Secretary, as follows:

The year of our Lord 1901 marked an epoch in the history of Dental science in that it saw the organization of a society devoted to the promotion of Orthodontia as a distinct specialty, to be taught and practiced as such. I have thought it not unwise, as Chairman of your Committee on Orthodontia, to direct your attention to the organization of that society and to mention some of the reasons which seem to justify its existence, for, in the words of the President of the society, in his address at the first annual meeting at St. Louis, June 11, 12, 13, 1901, "if there be good and sufficient reasons for such a society, they should be known and recognized by the lovers of all branches of medical science, and the sympathy and assistance of all enlisted, that the greatest degree of benefit may be conferred, not only on the science of Orthodontia but on humanity at large, to whose welfare all laws enacted, and all societies organized, owe their first duties."

To the student of the history of Orthodontia there are reasons that are self-evident. Although we know little or nothing of its genesis, it is probable that there has always been more or less malocclusion, and consequently more or less successful attempts to correct or prevent the same, extractions doubtless having been early resorted to for the relief of crowded malposed teeth. The written history of Orthodontia as found in our literature consists largely in the description of appliances designed to meet the requirements of special conditions, each case apparently looked upon as an entity, governed by laws peculiar to itself, and to be treated accordingly,

regardless of principles and too often in violation of physiologic requirements and hygienic conditions.

Quoting from the Presidential address—referred to above—"While the demand for general operations in dentistry supplies with perhaps as high an average of skill as any of the branches of the arts or sciences, the same cannot be said of orthodontia, for notwithstanding the fact that malocclusion, with all its baneful effects, has grown to be almost the rule instead of the exception, only the merest fraction of those needing attention are receiving it, and even such treatment as is meted out is of such a nature as to leave but little doubt in the mind of the careful investigator that more blunders are committed than successes achieved. Notwithstanding the fact that dentistry proper and orthodontia have been so intimately blended, yet the number who could pass an intelligent examination in orthodontia, or who could scientifically diagnose and meet the requirements in treatment of any but an average case * * is remarkably limited. * * * * * * "Why is it that so little really good work is done in orthodontia in proportion to the opportunities and its importance? Why is orthodontia, in practice, but a side issue to all other operations in dentistry? Why is instruction in this branch, in our colleges, so defective; why are the discussions of papers on this subject, in our societies, so weak; why is there such a lamentable number of failures and blunders in the treatment of cases? The answer is found in the fact that orthodontia is a science in itself, with requirements in its study and practice so radically unlike that of other branches of dentistry that the two can never be profitably combined, either in the study or the practice." The specialization of orthodontia is on a par with the specialization of the various branches of general medicine and the same marvelous advances will doubtless follow. And here we find the true reason for the organization of a society devoted to the advancement of orthodontia as a specialty. "Our best efforts can only yield the best fruit in strong, earnest, sincere, concerted action."

The papers presented at the first annual meeting of the society are worthy of careful study.

Dr. W. Booth Pearsall (Dublin, Ireland) in a cordial letter of greeting, urges the study of orthodontia by scientific methods; the investigation and record of truths gathered from reliable sources;

the placing on record by means of casts, diagrams and photographs, well-selected examples of malocclusion, duplicating the same for the purpose of interchange for school and other museums. Dr. Pearsall pointed out the great need for a more accurate nomenclature, and I commend to your attention the suggestion that the term Maxilla be applied exclusively to the upper jaw, similarly the lower jaw to be known as the mandible; "maxillary" and "mandibular" teeth to supplant the meaningless terms "superior" and "inferior."

Herbert A. Pullen, D. M. D. (Buffalo, N. Y.), presented a valuable paper on "The Laws of Articulation," emphasizing especially the distinction between the term "occlusion and "articulation." I quote the summing up of his paper:—"The laws of articulation are important aids to us in diagnosis, prognosis, and treatment of malocclusion, to appreciate which we should note their working in each case presenting, not only with a view of gaining personally by so doing, but also with the possibility of discovering new practical points tending to progress in our chosen specialty, along lines which promise much, and toward which I can only point the way."

Dr. W. J. Brady (Iowa City) discussed the mechanism concerned in the operation of occlusion—"a factor to be reckoned with in nearly all operative procedures, especially those that involve any restoration of the contour of the teeth, one of the vital points in every prosthetic operation, including the vast sphere of crown and bridgework. Scarcely an operation is performed within the fields mentioned but that is in some way materially influenced by the occlusion of the teeth, and yet nothing is more constantly overlooked and disregarded. * * * The study of occlusion includes consideration of the form and size of the jaws and the superimposed alveolar processes, together with the anatomical relations of the temporo-maxillary articulation. It includes the study of the effect of the nasal or pharyngeal troubles upon the development of the jaws and the shape of the arch; the time and manner of the development of the teeth, absorption and eruption, with the great influence that the lips, cheek and tongue exert over their assuming their proper places in the arch following eruption; it includes a study of the forms of the individual teeth with their relative sizes, and the shape and number of their ridges, grooves, sulci and cusps; * * *

a consideration of the occlusal planes of the teeth and how each and every cusp, ridge and surface occludes with the opposing teeth."

Dr. W. O. Talbot (Biloxi, Mass.) contributes a paper on the Disproportionate development of the upper and lower jaws, including simple rules for determining their *supra* or *sub* normality; rules based upon the definite relations known to exist between the bones of the human body, variation from these definite proportions serving to give variety in form and stature.

Searching for some rule of proportion in the size of the upper and lower jaws, together with the other bones of the face that have to do with the facial outline and give expression, Dr. Talbot, after the examination of a number of cases, reached the following conclusions:

I.—When the teeth are in normal occlusion and "the line of harmony" applied, there are three points of the face that are in the circumference of a circle described by the compass, having the condyle of the lower jaw as the center. These three points are (1) the point of the chin; (2) the tip of the nose; (3) the frontal eminence (about one inch above the line of the eyebrows).

II.—When the upper teeth are in a normal position, and the jaw normally developed, the point between the cutting edge of the upper central incisors, and the concavity between the nasal bones, on the ridge of the nose (between the eyes) are equally distant from the condyle of the lower jaw, measured with the compass.

III.—When measurement (I) applies, and (II) does not, the deformity is in the upper jaw; if *overdevelopment,* the point of the compass in measurement (II) will not reach the edge of the central incisors. If the lower jaw is not sufficiently developed, allowing the teeth to crowd, the point of the compass will pass beyond the incisors.

IV.—When measurement (II) applies and (I) does not, the deformity is in the lower jaw. If *over* developed, when the point of the compass is placed on the point of the chin, with the other point on the condyle and a circle described, the point will miss the nose and go high up on the forehead, in extreme cases going over the forehead. If the lower jaw is subnormally developed, the point of the compass, when adjusted to touch the point of the nose and the frontal eminence will miss the chin.

Dr. Richard Summa's paper was devoted to a critical review of Dr. Goddard's chapter on Orthodontia, in the American Text-book of Operative Dentistry; contrasting unfavorably Dr. Goddard's "fifteen classes of irregularities" with Dr. Angle's "three classes of malocclusion," each with its division and subdivision. Dr. Angle's classification, admirable as it is, appears to the present writer deficient in that it fails to provide for a distinction between cases in which the upper teeth are mesial of their proper position, and cases in which the lower teeth are distal of their proper position. We may, for instance, have two cases in both of which the lower arch bears a distal relation to the upper, and yet they may require very different treatment from the fact that in one the upper arch may be in its normal position *in relation to the rest of the face,* with the lower arch distal both in its relation to the physiognomy and to the upper arch; while in the other, with the same relative position of upper and lower arches it is the lower arch which is normal in relation to the rest of the cranium and face, the defect being really in the upper jaw. The first is a case of inferior distal occlusion; the other of superior-mesial occlusion. The first case requires that the lower arch be advanced; the other that the superior arch be retracted. To treat the two cases alike would be a very grievous error.

L. W. Beardsley, M. D., (St. Louis) in his paper discussed the "Power of Specialization," basing his argument on physical laws: Attainment is resultant from the application of study to knowledge, the rate of attainment depending upon the amount of study and the bulk or mass of knowledge. As the mass of knowledge grows larger, so must our thoroughness decrease. But divide the mass of knowledge and redivide and subdivide directing our power of study toward one of the subdivisions and it follows that our rate of acceleration, or our thoroughness of achievement, increases proportionately.

Dr. Grafton Munroe (Springfield, Ill.), discussed the essential requisites of an efficient appliance for the correction of malocclusion and abnormalities in the arches, namely, simplicity, delicacy yet power. inconspicuousness and stability of attachment. The human mouth being built as a vault spanned by an arch with two concentric arches carrying the teeth, the regulating arch which follows nature's own plan is logically the most appropriate form for an

adjusting appliance, recognized as such as far back as 1726, when, as we learn from Dr. Munroe's paper, Fauchard introduced this device.

In a paper entitled "Is Orthodontia Justly Represented by its Teaching?" Dr. Lloyd Lourie discussed the methods of teaching Orthodontia, as outlined in the announcements of different colleges, his contention being that too much time is devoted to making appliances—taps and nuts, bolts and bands, tubes and screws, appliances simple and complicated, patented and original, his conclusion being that present methods of teaching Orthodontia do not justly represent Orthodontia, but tend to create an aversion to a study which should be fascinating. There should be more teaching of principles, and less of technique, the greatest hindrance being a lack of system. What the student needs is a thorough familiarity with the principles which will enable him to diagnose the cases which come under his observation. "Occlusion being the very foundation should be given the first consideration. With a knowledge of its principles, and a thorough appreciation of their far-reaching possibilities there is less need for consideration of problems otherwise difficult of solution." "It is of the very first importance that students of dentistry should be given such instruction as will form a basis for intelligent diagnosis and prognosis. They should have that if nothing more."

In the present writer's opinion, second in importance and order of consideration to occlusion only is the relation of each arch and each half arch to the face, for upon the facts ascertained by such an investigation should often depend which of several procedures it would be proper to follow.

Discussion of Dr. Walker's Paper.

Dr. W. O. Talbot, Biloxi, Miss.:—I appreciate very much the paper just read. This is a question of great importance to our profession; one that I have been interested in for a number of years. It is a subject that seems to grow wider as we study it. At first appearance, the disarrangement and misplacement of the teeth in the arch may seem very simple, and we may think that they may be placed in alignment very easily, but, when we study the subject closely, investigate the causes of these irregularities, we find that we often have something to contend with that will tax us beyond

our ability. I have seen a great many cases that were almost ruined, and the patient left in a worse condition, from the simple method of extracting to correct an irregularity. I have in mind one case, in particular, in which a gentleman attempted to correct a simple irregularity in the lower jaw. The anterior teeth were badly crowded. The child was nine years old—lower first molars badly decayed. He extracted the lower first molars. The child is now 14 years of age; the lower teeth are regular and even; the lower arch is smaller than the upper; upper teeth are badly crowded; cuspids out of line, and the consequence is, we have a very serious condition to treat, simply done by extraction to get room. We should give this subject more study, and I am in accord with the suggestion in the paper that urges upon the profession a more careful study of Orthodontia. I believe the time is coming when people will so appreciate Orthodontia, that it can be made a specialty.

Dr. Crawford:—There was an impression made on my mind that they propose to separate this department form general practice. I would certainly be very much opposed to such a step. I do not mean to be understood that I would be opposed to a gentleman devoting himself to that feature of the profession, but to undertake to say that when a practitioner finds a tooth out of place, he is not to put it back, but must leave it to a specialist in Orthodontia, I think, is a move in the wrong direction. We have too much tendency towards specializing. Too much stress is laid on this idea of specializing. I have heard that a great many advocate the separating of Mechanical and Operative Dentistry. I am bitterly opposed to any such move. I believe a man makes a better operator from being a prosthetic man, and so with the other branches of dentistry, I believe we can do most good and get better results from being all round dentists.

Dr. J. P. Corley:—I am sorry that I missed the paper. I heard only a few closing paragraphs, but with the permission of the essayist, I will say a few words on Dr. Crawford's discussion. Some of his statements seem to reveal the whole life of the man. I am surprised that he should be opposed to the specializing of dentistry. I do not see why we cannot specialize as well as can the medical profession. I think there is just as much reason for it. Dr. Crawford would not go to a general practitioner if he wanted his eyes treated. The rea-

son why we are less proficient in any special branch, is because we try to do everything.

When Dr. Walker wrote me that he thought of going to New Orleans to practice Orthodontia, and asked me what I thought of the plan, I commended it. I think it is one of the greatest evidences of progress to know that we are able to specialize in dentistry. The time is coming, and I long to see it, when we will be compelled to specialize. In order to make a success of any branch, a man must be in a position to devote the proper time to the study of that branch. We try to do too much, and do not master any one thing. How much time has the busy practitioner to devote to the study of a case of irregularity? Not enough to assure him of success. The same is true in Operative and Mechanical Dentistry; the man who goes from his laboratory to operating upon the delicate tissues of the mouth, cannot possibly get the same results as the Operative Specialist.

Dr. Finley:—I feel that I must endorse what Dr. Crawford has said. It is possible for us to specialize in the different branches of dentistry in the large centers of population, but in the majority of practices of the dentists throughout this broad land, a man must be an all round dentist in order to take care of the patients that come into his hands. To thoroughly appreciate what is best for our patients, we must be able to perform all the different dental operations. The greatest good is done to the patient by those dentists who have never attempted to specialize, but are able to do everything. The essayist brought out the point that there was much harm done by the extraction of teeth for the correction of irregularities. I agree with him here. The trouble with most of the profession is, that they look at a case, decide that a tooth must come out, and act accordingly. Casts should be made and thoroughly studied before attempting to correct same. This is where the mistake is made. We should devote more time to the study of individual cases. I am opposed to the dividing up of dentistry into specialties. It may possibly do in the large centers of population, but I say it is not practical in the main body of our profession.

Meeting adjourned to meet Friday morning at 8:30 a. m.

There was no business meeting Thursday night, on account of banquet tendered the Association by the Atlanta members.

FOURTH DAY—MORNING SESSION.

Meeting called to order by the President at 10 o'clock A. M.

The Committee on Life Insurance being called, Dr. J. Y. Crawford, of Nashville, made the following report:

Dr. Crawford:—I have no formal report to make. About the most encouraging report I have to make of progress on this line is that we have organized a local dental society in our city. We are in accord with the spirit of this Association, and also with the State Societies. About a month ago we had a meeting and it was suggested that we appoint an Executive Committee to discuss the merits of the question: Whether it would be proper to have any questions introduced into the medical examinations. In discussing it, it was requested that each member formulate in his mind one or more questions to be incorporated into the medical examination, touching the question of life insurance. To my mind, the most difficult problem we will have to solve is to decide the number, form, and extent of the questions. I want you all to go home, and do what we are doing there. We had a medical examiner to meet with us, and we put to him two or three questions on this line. It had never occurred to him before, but he thought it a good idea to ask some questions with regard to the condition of the oral cavity. Within the last few years, questions have been added to the medical examination for life insurance, that were never required before. Take the question of Appendicitis: Hardly by any process of demonstration can we determine what influence Appendicitis has on the mortality rate of the country. Taking the statistics of the companies, it would be difficult to tell what effect this disease has on the death rate in the insurance companies. I think that statistics will prove that diseases of the oral cavity have more effect on the mortality rate of this country than Appendicitis. We asked this examiner if he thought we would have any trouble in having incorporated in the medical examinations a few questions with regard to the oral cavity. He said he did not think it would be. We illustrated the effect by a hypothetical case, as follows: An application would come from Mr. A. and Mr. B. The examination showed them both to be of doubtful character: Take Mr. A. and Mr. B. to the dentist, and have their teeth examined; find that Mr. A. had a perfect set of teeth, but Mr.

B. did not have a good set. We asked if he thought this would have any effect on the applications. He said it certainly would. We then asked him if he would consent to having inserted a question with regard to the examination of the teeth and the oral cavity, and requiring that they be put in good condition. He said he thought we could have such questions inserted.

Gentlemen, it would certainly be worth a lot to us. We have two problems to solve. One is to agree on the number and type of these questions, and the other is the amount of value attached to these questions. The justness of the cause is beyond question. As the Committee did not have an opportunity to make a formal report, I take the responsibility of asking for extension of time to this Committee.

On account of the press of time, motion was made to have Dr. W. E. Walker's paper on the "Review of the Current Literature on Orthodontia," read by title. Dr. Walker's paper was as follows:

Dr. A. H. Thompson, in a paper entitled "A Study of Comparative Occlusion, and Its Bearing Upon Orthodontia" (Dental Cosmos, Jan., '02), discusses the force with which the mandible is closed upon the maxillaries in food reduction; the means of measuring and testing the power, and modifying influences. Quoting from John Ryder (1878) on The Mandibular Movements and Occlusal force as the proximal causes of tooth modification in form, tissual structure, position, and supporting environment, the teeth developing in accordance with the occlusion, taking their places to meet the demands of use, the supporting environments being evolved to give the teeth stability and permanence, Dr. Thompson discussed the causes of abnormal developments, deformities and disarrangements. He says: " . . . Among the most potent of these are the inherited effects of disuse. The lack of use, in the parent, is undoubtedly transmitted to the child as a deficient growth stimulus, and appears in the defective development of the parts which have not been employed, and accrues from generation to generation. This is a fundamental law of evolution. The lack of development of the masticating apparatus in a child can to an extent be laid to the disuse of these parts by the loss of the transmitted effects of normal occlusion. Then the child also, because of the imperfection and inefficiency of the parts fails to develop any occlusive power at all,

and the erupting teeth accordingly fail of a proper arrangement in the jaws. In other words, the occlusive force must be exercised, to attain the proper development of the parts. Failing in the occlusive force, normal development fails. That is a logical conclusion. . . . Nature is niggardly of her expenditures, and wastes no materials upon parts which are apparently useless. As soon as a part ceases to be employed, and employed actively and usefully, she sets about its reduction by the workings of the natural principles of the economy of growth. . . . The effects of disuse are apparent in all forms of mal-occlusion and mal-development of the bones of the jaws. Irregular teeth being inefficient and inconvenient for the purpose of mastication, this necessary function is gradually neglected and falls into abeyance; the food is never properly masticated, and the parts remain undeveloped and embryonic to a degree. For this reason, after the correction of an irregular condition and the restoration of normal occlusion, the patient should be instructed to masticate the food thoroughly and hard, to the end of inducing a redevelopment and a hardening and strengthening of the parts. Not having been accustomed to the performance of normal and hard mastication, much voluntary effort will be required to establish the habit, but it is absolutely essential that it should be performed."

Dr. J. Sim. Wallace, in the Dental Record (Nov.) discusses the influence of Heredity with reference to the Diminution in size of the Human Jaw. He mentions three principal causes of the diminution (a) From muscular inactivity; (b) The more posterior position of the whole arch, due to the diminished size of the civilized tongue, and (c) the smaller size of the teeth themselves; the conclusion being that, to a large extent, the size is not due to heredity, but is largely a characteristic redeveloped in each generation as the result of the action of the environment.

Mouth-breathing and Distorted Arches.

In the Dental Cosmos, October, 1901 (Periscope), is found an excerpt from a paper by Mr. Mayo Collier, delivered before the British Laryngological, Rhinological and Otological Association (published in The Lancet), from which I quote: "The association of mouth-breathing with high palate, unsymmetrical upper jaw, prominent nose, open mouth and thin, flattened face, is a constant

one. . . . I am old enough now to have seen many instances of children with beautifully formed faces, symmetrical dental arches, and perfect nasal respiration become in after life quite altered. The upper arch has become so distorted that the molar teeth on each side are approximated so that the teeth of the upper jaw rest only by their edges on the teeth of the lower jaw, whereas the incisor teeth of the upper jaw protrude forward and hang in front of the incisor teeth of the lower jaw. The whole of the upper jaw may become atrophied, the nasal respiration almost entirely suspended, and the palate highly arched and V-shaped, and the mouth constantly open. Why this change? . . . Hereditary tendency in these cases did not exist, the parents in all these instances having remarkably well-formed upper jaws, and being particularly good-looking. I can produce the same effect on any young animal chosen indiscriminately by blocking its nose for a long time with cotton wool. Is it unreasonable to suggest that turbinal atony and hypertrophy in the young and growing subject will act as the piece of wool in the nose of the young animal? From what I have said as to the alteration in the air-pressure inside the nose, consequent on anterior occlusion, you will gather that a small increase of pressure from without, constantly applied on the walls of the nasal box is capable of pushing up the palate, disarranging the upper mandibular arch, and causing general atrophy and an undeveloped condition of the whole upper jaw. Moreover, if these cases are taken in an early stage, and the respiration is restored, the constant stream of air passing through the nose, molds and expands the upper maxilla, and in time the greater part of the deformity will disappear."

JUMPING THE BITE.

Dr. Eben Flagg discusses the subject of JUMPING THE BITE in the Dental Brief, Nov. and Dec. issues, the first paper of the series having been published in the same journal, April issue, in which paper Dr. Flagg described the methods and materials used by himself in the making of bolts, jackscrews, tubes, taps, bands and nuts, etc. A case is also described and illustrated, in which an undeveloped maxillary arch was expanded and the teeth brought into position without any operation upon the lower jaw, occlusion being then only possible by a voluntary thrusting forward of the

jaw until the lower second molar closed correctly in front of the corresponding upper, instead of behind it as in the original false occlusion. A band bolted around the upper second molar had a wire soldered to it in such wise as to prevent occlusion when the jaw was retracted. The depressed bicuspids grew up to occlusion without any assistance, while the action of the masticatory muscles brought the condyles to their correct position at the temporo-maxillary articulation, frequent massage over this region serving to relieve the strained feeling while the change was being effected. The case described in the November paper is one of "Jumping the Bite Backwards," the lower jaw having been retracted. In the treatment of his cases it is the custom of Dr. Flagg to make duplicate models, from one of which the teeth are removed with a fine saw, and rearranged, as is done with porcelains in prosthesis, demonstrating what would have been the proper arrangement of the teeth if nature had not been, in some way, interfered with. The readjusted models serve as guides for the construction of the apparatus for the case. In the third paper of this series (Dental Brief, Dec. issue) Dr. Flagg discusses the causes of malocclusion, its infrequency in the deciduous set; the factors in the work of correction, especially the determination of blood to the tissues, an accelerated, healthy circulation giving tone to the parts, supplying them with the elements necessary to their rebuilding and restoring them to their normal typical form.

In the Dental Review, September issue, may be found a valuable paper on Jumping the Bite, by Robert McBride, D. D. S. (Dresden); read before the American Dental Society of Europe; and the discussion of the paper by that body. The paper is amply illustrated with photographs of casts and portraits "before and after."

A paper entitled "Incisor and Profile," by C. L. Goddard, M. D., D. D. S. (Dental Digest, Nov., '01), is of interest to Orthodontists, showing, in mammals, the progressive reduction of prominence in the incisor region, through the suppression of incisors and the reduction in the number of premolars. The typical number of incisors is three on either side, which in the quadrumana is reduced to two, the work continuing in our higher civilization in the frequent absence of the lateral, or its presence as a simple cone. In the discussion of this paper Dr. C. N. Pierce emphasized the fact that wherever there is increase in the size of the brain-case, there is a

lessening of the length of the lower jaw and of the number of the teeth. As illustrated in the lower animals, the marmoset has a larger brain-case than any other monkey and is the only one that has no third molar.

In a paper entitled "Some Esthetic Considerations in the Treatment of the Teeth in the Incisal Region," by Dr. B. Holly Smith; read before the American Academy of Dental Science (Boston); under the head Orthodontia, Dr. Smith gives illustrations of the models of four cases in which the patients were respectively 50, 43, 35, and 28 years of age; showing very encouraging possibilities in the correction of irregularities "after youth has lapsed into middle age," the general impression being that this is impracticable. In one case 20, and in another, 10 years, had passed since the patient had been assured that it was *too late.* "All had opportunity for previous relief which had not been afforded."

Other papers worthy of your attention and study which may be mentioned are as follows:

"Some Observations on the Motions of the Mandible;" by Messrs. Tomes and Dolomore; and a "Criticism" of the same by T. E. Constant, M. R. C. S., L. D. S. (Eng.); to be found in The Journal of the British Dental Association.

"Is the Symmetrical Extraction of the First Permanent Molars Justifiable?" by Dr. Elof Forberg (Stockholm), read at the meeting of the American Dental Society of Europe. (Dental Review, Nov.)

"Regulating Pulpless and Pyorrhea Diseased Teeth;" by Calvin S. Case. (Same journal.)

"Restoration, Correction of Curves and Advancing Bite, by Means of Bridgework;" by Dr. W. S. Davenport, of Paris; published in the Dental Review, July issue, but of which the accompanying illustrations are found in the October number of the Review.

Dr. R. K. Luckie, Holly Springs, Miss., chairman of the Committee on Oral Hygiene, not being able to attend the meeting, his report was read by Dr. Corley, as follows:

Mr. President and Gentlemen:—As Chairman of the Committee on Oral Hygiene, we beg to offer the following report:

We are prepared to present you with two papers; one from Dr. F. W. Stiff—subject 'Our Next Forward Movement"—teaching

Hygiene; and one from Dr. J. P. Corley—"Practical Points in Teaching Hygiene."

Two members of our committee Drs. Finney and Beadles are situated so that they could neither write papers nor attend this meeting.

In the field of Oral Hygiene there is much ground to cultivate and keep many men employed for an indefinite time.

The work is one of preparation for war in time of peace guarding the weak places and fortifying against the ravages of disease. The prevention of diseases certainly looks to the diseases themselves, and their etiology for a rational course of procedure.

How many of us give any thought to Oral Hygiene? Many dentists think that when they find and fill a cavity, or perform any dental operation, their work is done except to collect the fee. This is not right. We must talk; we must urge; we must advise and do whatever may be necessary to impress upon our patients the importance of cleanliness. The true dentist makes his patients feel that he is practicing his profession for their good, instead of his own.

A clean mouth, how important. This is the gateway to the system. We see with our eyes; we hear with our ears; but nothing enters the physical system except by the mouth. Almost every disease, either directly or indirectly, enters by the mouth. Even in a healthy mouth, so considered, there are thousands of germs. How many thousands more are there in an unclean mouth.

The practice of Oral Hygiene means that we must use prophylactic methods—brush—brush—water—water—toothpick—floss silk, soap, pastuerine, listerine, etc.

We must give much free advice with no idea of immediate gain.

The professional man has the good of his patients continually before him and is always on the watch.

"Cleanliness is next to Godliness."

The ancient Jews recognized this truth in their purification ceremonies, in circumcision, in refusing to eat impure food, in the careful slaughtering of the animals for food. Dimly, many of the ancients found out important truths which the science of modern times has verified and given the causes and the "why." We often fail to live up to the knowledge we have, thus allowing an attack of

the enemy disease, which like a good general is seeking the weakest point.

Nature has made good defenses for us and it is our duty to look to them and to repair the broken down places. Nature has been outraged, otherwise there would be but little work for medicine in any of its branches.

Nature's laws are continually being broken and the penalty is sure. Hygiene, prophylaxis—these are the watch words. Dr. George H. Hardisty, N. Y., says: "We have all been surprised at what we deem gross ignorance of dental prophylaxis, revealed in those, otherwise so highly informed and cultured, but have overlooked the fact that a perfectly normal and healthy mouth naturally requires no more attention or care than any of the rest of the mucus membrane covered organs.

Another fact, however, is that a perfectly normal, healthy mouth is one of the most rare of all beauties we behold. But on the contrary, the mouth is usually the hotbed of bacterial pollution.

Parental ignorance as to so simple a need of Oral cleanliness, is one of the startling things the dentist has to contend with. See the children that are reared to-day. Notice the condition of their teeth and the wrecks of humanity they are, while the parents are oblivious to the consequences of their neglect, paying too little heed to the physical welfare of their own offspring, conditioned largely by the septic character of the bacterial growths, their ferments and toxins that affect the mouth and find there way into the system.

With the widening sphere of the dentist's usefulness, the demand for his knowledge of how to prevent certain difficulties and lessen possible recurrence of oral imperfections, etc., has become the order of things. Right here is where the dentist should grow and become liberal in the generous giving from his acquired store of useful information.

Fifth District Dental Society. N. Y., Cosmos, August, 1901.

"THE GOSPEL OF THE TOOTH BRUSH."

This phrase quoted from Booker T. Washington, by Dr. F. W. Litch, is used by him as the text of an editorial article in the December Dental Brief, condemnatory of the perfunctory use of the tooth brush as a part of the morning toilet for cosmetic rather than a hygienic purpose, without any adequate conception either of the true purpose of the act or of the proper method of its accomplishment.

The prophylactic value of the tooth brush being reduced almost to the vanishing point, though when properly used it helps to save teeth and hence to promote digestion, and thus sustain those vital forces through which alone civilization can be achieved or perpetuated.

Dr. B. F. Arrington says the brush and water practice, with the aid of finger massage, is preventive treatment—simple, practical, and is a surer means and guarantee of results desired—well preserved teeth and gums and freedom from unwholesome taint of breath—than can be effected by any other line of treatment. Until effort is made intelligently upon conservative lines, we will never know what can be accomplished with tooth brushes for the preservation of the teeth and gums. There is work before us and the field is broad that all may work who will. Great stress is laid by recent authorities upon the use of stiff, hard brushes, not alone for the purpose of cleanliness, but as a condition of physiological toughness. Dr. J. W. Wassell prescribes four extra hard brushes, to be used alternately to prevent the water soaking to which the brush is liable when used at too short intervals. He says the brush should be applied vigorously and thoroughly five minutes at each cleansing and twice a day, brushing the gums as vigorously as the teeth, thus supplying the physiological needs of the gingival tissue.

Dr. D. D. Smith, of Philadelphia, claims remarkable results in the betterment of tooth structure through systematic stimulation,

through friction, using pumice or orange wood stick with hand pressure, thoroughly polishing all exposed tooth surfaces at frequent and regular intervals. Dr. Smith's theory is that: admitting it to be a fact that—when a tooth, bad or good, hard or soft, is removed from its environments—from the menstrum of the mouth decay is at once arrested. It follows, that enforced and systematic change in the environment of the tooth in the mouth will prevent decay, and will carry with it many other beneficial results; results obtained wholly from clinical investigations and experimentation. This change in environment is obtained by the thorough removal at frequent and regular intervals, whether solids, inspissated, excretions, semi-solids or bacterial formations from all the exposed surface of the teeth, leaving the enamel or whatever of the tooth may be exposed thoroughly polished and thus in the best condition to void hurtful deposits and equally to favor all efforts of the patient in the direction of cleanliness. Dr. Smith claims that the benefits are not confined to the enamel or treated surfaces alone, but that equally pronounced results are apparent in the dentine and cementum.

Through this stimulation of the life forces of the tooth discolorations are removed, white spots on the labial surfaces of the front teeth resume a normal life-like appearance. The gum tissue assumes a healthy appearance, the festoons are improved, retarded and erupted processes are hastened while the general health is benefited, through the removal of the excretions of gum and alveolar tissue, preventing the introduction of toxic matter into the stomach and lungs.

Adenoids and Hygiene.

A condition which we too frequently overlook and yet one we should be prompt to recognize and overcome, is the presence of adenoid growths with the sequence of malformations of the arch, malocclusion of the teeth, lack of mastication and malnutrition. Malocclusion consequent upon the narrowed superior arch is followed by malnutrition; for children so affected cannot masticate their food thoroughly. Owing to nasal obstructions, secretions are constantly dropping which affect taste, causing lack of appetite.

The air (on account of the mouth breathing) is not warmed and filtered by natural methods; the blood in consequence is not properly

oxygenized. In fact metabolism is interfered with in every way, with the results of ill-nourished anemic children often with defective mentality.

Fannie E. Hoopes, M. D., D. D. S., Cosmos, August, 1901. Dr. M. C. Smith condemns the usual practice of referring such cases to the rhinologist for operation. He says the rhinologist can remove the adenoids, but that is all he can do; the dentist should be prepared to do this and much more. It is as much a dental disease as is the toothache, and in nine out of ten cases the alveolar arch needs to be widened. This will bring down the septum and give better air space. The dimunition of air supply caused by the diminished passages; the introduction of air through the mouth on account of the closed nostrils and the effect upon the digestive apparatus by the dropping of the effete matter from the throat with the food supply, together, bring about a state of degeneracy, physical and mental, often resulting in the most lamentable breakdown.

In regard to diagnosis—most authorities recommend that the diagnosis be made by introducing the finger into the vault and by so doing feel the glandular mass; but, says Wendell C. Phillips, M. D., this procedure is very painful, makes the patient gag and strangle, and also makes the little patient one's enemy for life. Instead, by a little persuasion, one can make a far better examination and diagnosis by means of the tongue depressor and a small mirror. This procedure is not painful, makes the patient a friend instead of an enemy, and gives confidence to allow any further treatment that may be required. There are many cases which present symptoms so marked that a positive diagnosis may be made without resorting to either method of examination.

Dr. Phillips says, that parents are generally becoming educated to detect the symptoms of these growths; but wide-awake dentists have an unusual opportunity to detect these symptoms, and with it comes a duty to add to their already useful avocation, that of aiding parents to see the importance of subjecting their afflicted children to operative interference and free them from these conditions with their long train of attendant symptoms and serious results.

Every advancement in the science of medicine and surgery, as well as every increase in the knowledge and efficiency in the indi-

vidual members of the medical and dental professions, means the saving of human life and the alleviation of human suffering.

Life Insurance and Oral Hygiene.

The bearing of Oral Hygiene upon Life Insurance was ably discussed at our last annual meeting.

The Editor of the Dental World (August, 1901,) in a brief report of the meeting, commenting upon the point said: "This phase of the subject of dentistry is new, but the importance of it is as old and as sure as the value of life.

Observation has clearly demonstrated that nobody is in health who is fed through a diseased mouth. It has been said that more soldiers die of disease than from bullets; it is equally if not more true, that more men and women die of diseased mouths than from any other cause.

It is believed by many medical authorities that nine-tenths of all diseases excepting contagion, are due to the unhealthy condition of the mouth and the nasal passages; the secretions of the mouth and nose when in a state of health, being a fortress against the invasion of many deadly germs. It can hardly be doubted that contracted arches are caused by adenoid growths in the pharynx and nasal passages, mal-forming the dental organs and resulting in weakened lungs and contracted chest.

In the examination blanks of Insurance Companies you may find such questions as: Did you ever have discharge from ear? We would add: Did you ever have abscess of antrum? They ask: Did you ever have renal or hepatic calculus? We would suggest: Did you ever have salivary calculus? and, What caused it? They ask: Did you ever have dyspepsia? We would ask: What caused it? They ask: Have either of your maternal or paternal grandparents died of consumption? We would suggest: Is your mouth in condition to fortify you against the culture of bacilli? They ask: Have you ever sought or been advised to change climate for your health? We would suggest: How much pus do you swallow each day from old abscessed teeth? They ask: How much do you weigh and has it changed in a year? How equally important is the query have you an impacted third molar, or have any of your teeth failed to erupt? They ask: When did you last consult a physician?

We would add: When did you last consult a dentist? They ask: Do you use intoxicating liquors? They should also ask: Do you use a tooth brush?

This suggestion is not the first the dental profession has offered for the protection of society from evils, The Insurance Companies would be stronger and the insured safer to have such safeguards as would better enable them to approximate the longevity of those at risk.

The only desire of those who rank in the medical and dental professions, is to have the health of the human body cared for as though it were "The Temple of God."

We commend these thoughtful suggestions of the Editor of the Dental World, Dr. W. H. Weaver, to the consideration of the members of the committee on Life Insurance.

Dr. Mora says: "If the importance of Hygiene was considered in proportion to the services which it renders, it would be the leading science and everything would be under its supervision. It embraces the study of all that can contribute to the improvement of the mind and body; for the influence of the mind over the body plays an important role in our existence and gives to a man character, more energy and more stability.

THIRD INTERNATIONAL DENTAL CONGRESS, COSMOS, JULY, 1901.

Mr. President we will say in conclusion, that if dentists grow to understand prophylaxis and can treat their patients successfully, the demand for dentistry will be very much less than it is now in the beginning of this new century.

Dr. J. P. Corley, of Greensboro, Ala., then read a paper on

Points in Teaching Hygiene.

Mr. President and Members of the Southern Branch of the National Dental Association:—Oral hygiene is of such vital importance, and is so little appreciated, that the oral custodian should employ every expedient that would facilitate its teaching. When I thought to write on hygiene, I meant to speak only of the technique of the dental toilet.

However, the apparent apathy in the ranks of the profession has led me to stretch my thoughts far beyond the limits of my topic. Touching upon these more fundamental principles, I merely reiterate

statements, which have been submitted to this body for at least fourteen years. If seeds were sown, their harvest, if any, has been reaped in private. But as this is in the nature of a reformation, and all reformations must be wrought slowly, we will continue to labor and to wait.

The Teacher. A doctor is a teacher, but do *we* deserve this honor? If we teach nothing further than the substitution of artificial organs, or the restoration of lost contour, then are we better, only in degree, than the mechanic, who repairs a machine.

A learned profession, based upon a preliminary preparation of mind and body, builded of the materials of all past civilization, honored by the most æsthetic minds, and best blood of the age, fostered and fed by an appreciative public, with the happiness and well-being of mankind dependent upon its exertions, and the progress and development of posterity measured by its own, cannot afford to underestimate its responsibilities or betray its trust.

Dentistry has developed along the lines of causation and restoration. The study of aetiology, through which we hope for prophylaxis and immunity, is too sacred a thing for the public, and is, therefore, confined to the professional talmud. Instrumental restoration, however, has caught and held the public fancy almost to the exclusion of preventive treatment.

Thus we plod along, patching or pulling and substituting, satisfied in our mechanic's realm, when we might stand in nature's galleries, directing the preservation of her handiwork.

The average dentist has many of the requisites of a successful teacher, ordinary intelligence, systematic training, daily contact with an intelligent clientele, a personal and sympathetic association with a wide range of humanity, together with the fundamental requisite of a reason for the faith that in him lies.

It is true that few teeth under constant and intelligent care will decay, and that still fewer need ever be lost. Therefore, the practice of oral hygiene is more prophylactic in its true analysis than any other preventive procedure.

AUXILIARIES. In the prosecution of this educational scheme one of the most important considerations is the engagement of allies. Otherwise our teaching must be confined to our patients, and this you know comes too late for the best results. An exposed pulp in

the tooth of a child not yet ten years old is a sight to make the devil weep, and yet a great many initial visits to the dentist are at the instigation of a complaining tooth. It therefore behooves us to engage an influence, which will reach this class before the ravages of decay have wrought such havoc. There are two sources, through whom we may work to this end; the literary teacher, and the practicing physician. The possibilities in this direction are unlimited, and our success will depend largely upon our development of these factors.

THE PUPIL. It is remarkable that few men appreciate the physical, mechanical, or æsthetic importance of the dental armature, and lamentable that they know nothing of its rational preservation.

It is amazing that men will be surprised, and women angry, if you try to convince them that their mouths are unclean. We may say that the majority of patients think that neglect means only the possibility of the expense and discomfort of a dental operation. They think further that after a tooth has been properly filled it will never again decay. Consequently they feel that, when they pay their bill, their whole duty has been discharged. This fallacy is due in a measure to the misrepresentations by the rank and file of the profession. We need to exercise tact in combating its baneful results, and in making the patient feel the responsibility of our operation, which is entrusted to his keeping. If we succeed in doing this, we at once rise to a position, from which the very acme of success is obtainable.

The first step toward enlisting the patient's co-operation is to awaken his interest. It usually requires a mental shock to do this. Many persons know that oral cleanliness is necessary from a prophylactic, as well as an æsthetic, standpoint, but they have never come face to face with the calamity, which inevitably follows neglect.

There are many ways of securing this interest. Each teacher must be in a measure the author of his own methods. Different individuals require different tactics. In one case he may feign horror and disgust, in another astonishment, in another indignation; in some instances he may assume an air of austerity and demand, in another anxiety; in another he may be overcome with a sympathetic despair. In all cases he must assure the patient that his services depend upon their obedience.

I find that, as a rule, children are to be commanded, women

angered, and men frightened. In any case, the patient must be so taken up that he may neither question your statements nor ask for advice. When this is accomplished, the battle is won.

The next step is detailed instruction. This must be done as master of the situation, with tact and decency, but in all frankness, concealing nothing pertaining to existing conditions. The patient should hold a hand-mirror, and follow the instrument as it points out the most vulnerable surfaces, and inaccessible localities. After the topography of the mouth has been carefully noted, a practical regimen is to be prescribed and explained in detail. The details of a classical dental toilet are too familiar to this audience to require notation here, but allow me to suggest in passing, a few auxiliaries, which I have found of inestimable value. Their adoption has often turned the balance in favor of success. I simply mention them, trusting to the discussion to develop their virtues, and emphasize their importance.

1. A practical knowledge of the geography and topography of the oral cavity.

2. The use of no aromatic dentifices, except in rare cases, and then only after the mouth has been cleansed as far as is possible by the intelligent use of a good brush, pure soap, prepared chalk, toothpicks, and an abundance of tepid water, together with massage, where there is even a tendency to gingivitis.

3. The constant and intelligent use of soft-pine toothpicks.

4. Massage where there exists the slightest gingivitis, or a low state of vitality in the gum tissue.

5. A pure tough chewing-gum, containing no flavoring, especially indicated where the teeth are deeply marked or irregular, or where the teeth and gums need exercise, or where the patient is so hopelessly lazy that no power will persuade him to clean his teeth otherwise.

SYSTEMIC HYGIENE. In this age of intelligence, and with the present status of dentistry, it is a standing shame that we should not have gotten beyond mere cleanliness in the practice of hygiene, and that the dentist should be required to do the drudgery of cleaning teeth. It is true that we occasionally find a patient, who appreciates the value of tooth and gum exercise, the importance of tooth nutrition, the dental sympathy with the systemic tone, and the rela-

tion, which the dental armature bears to the physical economy, but usually those subjects are thought to be either too sacred or too mysterious for the profane use of the laity (or the dentist either as for that), but are to be found only with the medical archives. Now and then, however, we have a mother, before whom we can lay these mysteries, and, if the present pace in the educational scheme is maintained, the day may come when we will look more to immunity than repair.

ORGANIZED EFFORT. Just at present, however, the most alarming feature of the situation is the indifference of the organized profession. True, we have taken one official step in the right direction, but it came through the efforts of a few enthusiastic men, and will amount to little unless supported by the rank and file of the profession. What then is the duty, which lies before us? I would say, let us cast about for ways and means to institute some practical working plan, which we could officially endorse. Then give it our moral and financial support.

Every State Society should have a standing Committee, one duty of which would be to memorialize its own State Educational and Medical Associations, and to insist that every medical college within its bounds should attach to its teaching corps a lecturer on oral hygiene and dental prophylaxis, and that all public and normal schools have some systematic instruction on the subject.

The question before us is a long, tedious and unending problem, one, which at present, presents insurmountable difficulties, but which also offers unlimited possibilities.

Discussion of Dr. Corley's Paper.

Dr. Crawford:—Dr. Corley allowed me the privilege of looking over his paper before it was read, with a view to my discussing it later. I am very sorry that I am not feeling well this morning, and do not feel like discussing it further than to say that I enjoyed the reading of it very much, and I think we all appreciate the importance of the subject.

I would like to ask that I be permitted to report that part with reference to life insurance as a part of the work of the Committee on this question.

Dr. W. H. Weaver, Lagrange, Ga.:—I enjoyed the paper. It is a

subject that I am very much interested in, and one that I feel will, in a short while, be appreciated as it should be.

Last week one of the most excellent young ladies of our town came to me and told me that she was going to be a trained nurse, and had written for admission into the Johns Hopkins University. She said they wrote her that she would not be admitted unless her mouth was in a healthy condition. This only shows that the more educated classes are giving this subject thought. The editorial referred to in this paper was caused by remarks of Dr. Crawford, and I think we are all indebted to him for his work along this line.

Dr. J. R. Beach, Clarksville, Tenn.:—While I enjoyed the paper very much indeed, I do not agree with the essayist in his remarks referring to the cleansing of the teeth. It may be "drudgery," as he says, but when one presents himself for this purpose, it is certainly our duty to give careful attention to every detail of this work.

Remove every particle of salivary calculus, brush the teeth well, removing all stains that should be removed, and run floss silk or small rubbers between the teeth, cleansing them in the best possible manner.

The patients will recognize the difference, and the feeling of comfort and cleanliness will stimulate them to keep their teeth in the proper condition. Urge upon them the necessity of keeping the teeth clean; instruct them in the manner of using the tooth brush; recommend some good antiseptic wash, and if directions are followed, a more perfect hygienic condition of the oral cavity is the result.

Dr. S. W. Foster:—I want a word on this subject. There is no subject that comes within the range of our profession that demands more attention than oral hygiene. Very often the patient does not appreciate this in any conception. I wish to call attention to a case we have in hand now at the college as the result of neglect. The patient lives near Atlanta. He had been suffering for some time with a broken down, inferior bicuspid. A few weeks ago he appeared at the college clinic with the bicuspid teeth very loose. The soft tissues breaking down as well as the hard tissues. After treating the case for a time for Necrosis, we procured a specimen of the tissue, and turned it over to our Pathologist for microscopic examination. After examination, he reported that it showed to be a

round-celled sarcoma, of the most malignant type. This necessitated the removal of a section of the lower jaw. On closer examination we found that the glands of the mouth had become infiltrated. The removal of the portion of the lower jaw means only temporary relief, and the final result will be that this man will die simply from neglect in the care of his mouth. The entire half of the lower jaw is involved, and we predict only a few months of life will be spared to him. We, who are connected with the colleges, come in contact with the lower class, and see a good deal more of this than the practitioners who deal only with the higher class.

Dr. J. P. Corley:—Dr. Beach misunderstood with reference to the cleaning of the teeth. What I had reference to, was removing stains from the anterior teeth. I think it is imperative that we remove all the deposits of calculus, but I think when we clean these stains from the teeth, we frequently do more harm than good. The patient will do nothing toward keeping them clean. My plan is to remove the calculus, but leave these stains, and tell them to go home and clean them. Teach them to make an effort to keep them clean. Make them do their own drudgery. It would be as preposterous to be asked by them to keep their nails clean. If we lose a patient by this course, we are better off without them. Make them feel the importance of their co-operation in the matter, and they will be more impressed with our services. As soon as we recognize the importance of compulsory oral hygiene, the better off we, and our patients, will be.

On account of being delayed in the mails, Dr. F. W. Stiff's paper was received too late to be read before the association, and was read by title, as follows:

OUR NEXT FORWARD MOVEMENT—TEACHING DENTAL HYGIENE.

Gentlemen:—There are a few words I desire to say to you on behalf, especially, of the poor people of our country, who need dental attention and who are unable to pay for it, even when they know their need, which is all too seldom.

It has become a common saying, however true it may be, that the rich are growing richer and the poor becoming poorer, year by year, in this country. Something should be done for these people who form the great majority of our population; to arouse them to a

realization of their need and at the same time to supply that need.

It will not be denied that the great mass of the people are poor, measured by the standard of their ability to have the best class of dental work done; and certainly no intelligent and thoughtful dentist doubts that they are densely ignorant as regards their teeth.

The time has fully come in our history as a profession,—a learned and progressive profession, to take cognizance of these two things in dealing with the problem of preserving the teeth of the people,—the poverty of the people and their ignorance. I will reverse the last terms of that sentence, and say rather, the ignorance of the people and their poverty,—for, if you teach a people what they should know about their teeth, it will not greatly matter, after a few generations, how poor they may be, so far as their teeth are concerned. They will have learned that, barring heredity and the action of certain medicaments, if they keep their teeth clean they will not lose them, and their being poor will prove a factor in the preservation of the teeth since they would more likely use simple food.

That they do not now know enough about their teeth to appreciate their value and to properly care for them, is a fact too well known to every dentist to require demonstration.

Think of the parents who come to your office, unaware that the 6th year molar is a permanent tooth,—and why it should be preserved; that the temporary teeth should be saved, and why; and many other things they should know in order that they might intelligently care for these valuable organs. The ignorance of the people in these matters is appalling and should awaken us to the necessity and duty of taking some adequate steps for their relief.

Let us seriously ask ourselves if we are doing our full duty to our kind, if we only repair the ravages of decay and put our patients' mouths in as good condition as we can. Is it not selfish in us to use our knowledge only for our own benefit?

Gentlemen, the time has come in our history when something better and greater must be done. We have, so far, been Operative dentists only. The Medical profession seems satisfied, in the main, to answer calls for the relief of their patients after they have been stricken with disease. We have been doing no more than this.

I fear that we too often forget our duty, so far as giving careful instructions for the care of the teeth, after completion of the work,

is concerned,—simply pocketing the fee and thinking our whole part done; let alone, if they are parents, enjoining them as to the care due their children's teeth. We must must not only teach those who come to us, but arrange to help the greater number who do not come and teach them, so that they will not need to come; projecting our work even to many generations unborn.

We must be Preventive dentists to do our best work.

Let us organize a movement looking to the dissemination of dental knowledge among the people; and to the accomplishment of this end, we will have to begin with the children in the schools.

This movement is already crystallizing into shape, as will be told later. It will not do alone to advise with parents when the children are brought to us; it is then too late, and then, so few are brought.

We have entered upon another century, the 20th of the Christian era. The 19th gave birth to and saw the great development of dentistry along Operative and Mechanical lines. We see that this is not enough by much; that notwithstanding the efforts of the dentists of this country, the teeth of the people are going from bad to worse, until some are so pessimistic as to believe that in a few hundred years we will be edentulous. I have faith to believe that there is a remedy for this, and that the 20th century will be noted in the history of our profession for the growth and full development of Preventive Dentistry.

As I have said above, the idea is already growing and fermenting in the minds of many.

Dr. D. T. Hill in the "Items" of Feb., 1900, well says "Amen" to higher education for dental matriculates; but asks if it is not a fact that an otherwise intelligent public, educated under our Free School System, are most astonishingly ignorant of all dental matters.

Let us take the children of to-day and educate them, from the time they enter school, as to the importance of the dental organs, and instill into their minds the great necessity for the proper care of the teeth. Thoroughly imbue them with this knowledge while at school, and when they have become the heads of families they will realize the great need of caring for the teeth of their own off-spring. When their children go to school, and are there taught what their parents learned before them (being at the same time instructed at home), it cannot fail to result in better care of the teeth, and in the

end, better quality of teeth. Keeping this up from generation to generation, thus spreading this knowledge throughout the land into the homes of all the people, they will learn to discriminate as to the quality of dental work, and quackery and charlatanism will grow to be a thing of the past; a reaction will take place in favor of longer life for the teeth, which many of us may not live to note, but which will be inevitable, and will entitle us to be kindly remembered by the oncoming generations.

We in Virginia are becoming interested, and two years ago a committee was appointed upon the suggestion of your essayest, to look into the advisability of securing the introduction into our Common School System the teaching of Dental Hygiene. This committee interviewed prominent educators on the subject, read papers before the Normals and School of Methods and at the last meeting of the State Association was instructed to take such steps as might be necessary to the accomplishment of this end. I might mention what is being done in other states did time permit. Further than all this and more far-reaching is the work now being done by the "National Dental Association."

At the meeting held at Old Point in 1900, a committee was appointed, styled the "Committee on Oral Hygiene in Our Public Schools."

This committee consists of Drs. Richard Grady, Chairman; Wm. Ernest Walker, Secretary; your honored President, H. H. Johnson, I. P. Wilson, and F. W. Stiff.

Their first work as set forth in a letter addressed to all the organizations of dentists in this country, is "to gather statistics regarding the frequency of dental caries and other abnormal conditions of the mouths of school children in the United States." To accomplish this end a series of blank forms was prepared to be used by those who were willing to make the examination where consent could be obtained from the authorities.

Such work as this is already being done in Germany and England. The examination of the mouths of 20,000 children between the years of 6 and 15, in Germany, showed that 95 per cent were affected with dental caries. It was also learned that there were in the whole number examined 372 anomalies of different characters, including hare-lip, cleft-palate, irregularities, V-shaped jaws, etc.

Dr. Denison Pedly of England, found that 75 per cent of the children examined had diseased teeth, which is thought to be a low estimate as compared with the condition on the continent of Europe and in this country.

Dr. Hopkins, in a fine article in the Feb. "International," writes, "It is not too much to say that 30 per cent of all teeth of children between the ages of 5 and 15 in the public schools of this country are diseased. This is appalling when we know that only a small proportion of these children will ever receive treatment at the hands of a competent dentist; and when we realize that without such treatment they must inevitably go from bad to worse, the situation becomes truly alarming.

It is for us to determine whether the human race shall become an edentulous race, or whether it is worth while to combat the degeneracy already begun and swing the huge pendulum the other way by eradicating disease and improving the structure of the human teeth.

It might be interesting and profitable to go into the relation of diseases of the teeth to general diseases and their effect in producing moral as well as physical degeneracy, but time will not permit me.

Let me ask again: Is the dental profession content to live for the day and themselves? Shall we not, rather be far-sighted and look to the future, and philanthropic and aim to uplift and help our kind, regardless of our own aggrandizement?

The situation is well worth our most careful attention.

It is said by competent and thoughtful observers, that there "exists a more or less marked ratio between the physical soundness and mental acuteness of the child and the condition of the teeth."

We must so educate the public that mothers of future generations will know that scrupulous care of their children's teeth is necessary, not only to save the teeth, but to insure good general health.

The best place for us to do this work (and we are the ones to do it) is the school-room. Get into the text-books what we want the children taught, and half the work will have been accomplished.

This will be difficult; it will take time, money and much work; but nothing we have ever done will be so beneficial to our people.

I trust that you present at this meeting when you return home, and appear before your local societies, will see that the movement for securing statistics is carried out (if it has not already been done)

so that we may have some data with which to impress the school authorities and the public. I am just in receipt of a circular letter prepared by the above mentioned National committee, to be sent to you personally, which contains interesting and encouraging reports from different sections, of the interest being taken and work done along this line.

Report of the Committee on Prosthetic Dentistry was called, Dr. J. R. Beach, Chairman, Clarksville, Tenn., made the following report:

After having been appointed chairman of the committee on Prosthetic Dentistry, I immediately entered into correspondence with not only members of the committee, but with other members of the Southern Branch of the National Dental Association, endeavoring to secure essays on this subject, on the presentation of excerpts from our current dental literature reviewing the past year, as suggested by our President, Dr. Johnson.

My efforts with one exception have proven futile, and while it is true it requires earnest work on the part of the chairman of the different committees to present a creditable report, yet it seems far easier to produce valuable papers or interesting features or suggestions pertaining to other practical branches of our profession than it does to this particular one,—Prosthetic Dentistry.

The question naturally arises, Why is this true? Why is it that so many of the best members of our profession either ignore altogether, or give so little consideration to Dental Prosthesis?

Is it not a fact that no dental service from an æsthetic standpoint is as a rule so illy performed as the Prosthetic?

Is it because, by some its accepted sphere lies in the construction of artificial dentures, considered by them to be more of a mechanical than a professional nature? This laborious work being principally executed by the frequently inefficient "help" in the laboratory; or is it due to the small remuneration we receive for this, as compared to other branches of the profession?

If the compensation is insufficient to justify careful attention to every minute detail of this work, then so establish the fee that we can afford to give the time necessary for the accomplishment of the best obtainable results, for it is in every way worthy of our very best efforts.

I do not believe that this lack of interest should be attributed to the fact that one may obtain from the "New York Dental Parlors" a "guaranteed set of teeth, put up and turned out while you wait,—for four dollars and ninety-nine cents."

Do they not make gold fillings for a dollar and gold crowns for five dollars, and if one preferred their services to ours, would they not go to them instead of coming to us?

Our duty is to the patient, and while it is true that the rapid strides of progress made in the dental science in the last two decades has so reduced the necessary loss of valuable teeth, that seldom it is we are called upon to restore a complete denture, yet, when the unfortunate ones present themselves for this purpose should we not give this as careful consideration as we would any other service we may render?

However, it is not my object to present a paper on this subject but to hear from others who may have something of interest to present to the association under this division.

Advancement has been made within the last twelve months and the field is *not* confined simply to the construction of vulcanite dentures, but many are the methods used for the replacement of the loss of one or more natural teeth by an artificial substitute.

The aluminum or gold lined plate, metal plates with or without rubber attachments, anchor plates of various kinds, continuous gum work, bridges,—stationary and removable;—all pertaining to this branch of dental science.

We shall first hear from Dr. S. W. Johnson, of Brownwood, Texas, who has a paper entitled "An Artificial Molar and Its Function." Discussion opened by Dr. R. K. Luckie of Holly Springs, Miss., and Dr. J. G. Fife of Dallas, Texas.

After the reading of this paper, we shall be pleased to hear from others; "the comparison of ideas is always educational, and as such, instruct the brain and hand of man," so give us the benefit of your experience, and thus awaken an interest in this important subject—Prosthetic Dentistry.

Under this head Dr. S. W. Johnson, Brownwood, Tex., read a paper on

"An Artificial Molar and Its Function."

I select these words to get on the side of Prosthetic Dentistry and make a point in favor of restoring the natural molar when lost. The function of an artificial molar is exactly, in all respects, the same as that of a natural one. Some might say it was to retain the contour of the face of a pretty woman, or to prevent the sunken jaw of the thin-faced man, or prepare the food for a weak stomach and fulfill all the motions, operations, and actions for which by nature it is fitted. All of this is true and more besides. The point that I want to get at is the part it plays in the perfect digestion of starch. Approximately 50 per cent of all the vegetable food we take is starch.

Taking the prosthetic view of a full denture we have 28 dentals. Twelve of these are incisors and cuspids, practically the other 16 are molars, or grinders. Eight of these, however, the bicuspids, are not more than two-thirds on their grinding areas (surfaces) as large as the remaining 8, the true molars. So letting a molar represent the unit of masticating surface, the 8 molars would represent 60 per cent of the whole masticating surface, and the eight bicuspids 40 per cent. The loss of one molar is the function loss of two, or 15 per cent of the whole masticating surface, because the antagonizing tooth's function is also lost. The loss of a bicuspid represents the functional loss of 10 per cent of the masticating surface. The physiological function of a molar (when I say a molar I include the bicuspids also) is to masticate the food and prepare it for the digestive fluids to act upon. And the more thoroughly it is comminuted the better it is prepared for these secretions to act upon. One of these fluids is the saliva. Saliva partially digests the starch of food and turns it to glucose. This is proven when you take a dry piece of bread and masticate until it is thoroughly moistened with saliva, when a sweet taste is experienced. This sweetness is the transformation of the starch into sugar or glucose. The next and only active secretion is the pancreatic juice which digests the starch more perfectly, and as some of our most authentic physiologists say, instantly, if comminuted so as to present a large surface of contact, and a ready permeability and tractable condition for the digestive fluids to act upon. I will illustrate what I

wish to impress in this way. If you have a few sticks of dry wood, and want to burn them to ashes as quickly as possible, you would split the wood up into as fine pieces as possible, and saturate it with oil or turpentine and touch it with fire, and combustion will take place in a few moments, and the pile of wood be reduced to ashes. But if you take the same sticks of wood and use the same quantity of oil or turpentine and pour it on the wood and set fire to it, this same wood, which was reduced to ashes in a few moments when finely split up will take possibly hours before the last coal will be an ash. So food containing starch when finely comminuted by mastication, is partially digested by the saliva, and when it reaches that more potent digestant of starch, the pancreatic juice, it is instantly attacked and turned to glucose, which is taken up by those fifteen millions little mouths, or absorbents in the intestines, the villi and valvular connivents, as an emulsion, and by natural organs made for that purpose conveyed to the heart for oxygenation to be distributed to the different parts of the body. And the individual feels refreshed and invigorated and health is abundant, because the molar gave a perfect and thorough grinding, splitting the food up finely, which resulted in a thorough insalivation which softened and comminuted still more perfectly, and partially digesting it, intermingled with the gastric juice which still separates the particles of food, possibly presenting a greater surface of contact by the time it reaches the secretions of the pancreas it is almost instantly turned to a condition ready for absorption by the mouths, valvular connivents and villi.

Perfect mastication, immediate digestion, instant absorption, good health. Imperfect mastication, partial digestion, non-assimilation, poor nourishment, bad health. A majority of human beings think all food is digested in the stomach, when in fact the stomach and its secretions have no direct effect whatever on the starch of food, and dental professionals are not entirely free from this erroneous idea, which is demonstrated by the way some of us gulp down our biscuit and rice, believing if we will do the deglutation act gastronomical satiety will do the rest.

Having shown you the province of a molar's function, I will desist, thinking "a word to the wise sufficient."

Discussion of Dr. Johnson's Paper.

Dr. L. G. Noel, Nashville:—This paper seems to be an appeal for the making of larger occlusive surfaces to the teeth in constructing artificial crowns and bridges, and of porcelain teeth—an appeal for more perfect forms and models of the natural teeth. We all recognize the good sense of these suggestions. We have heard old dental operators criticise the artificial teeth for many years, making them so small and curving them so imperfectly as to make it necessary for a patient to make a "center shot" in order to strike the teeth together. Only a few years ago this was the case. The bicuspids and molars were too small and too narrow, especially the molars. They were poor imitations of the natural teeth. The resorption of the alveolar process lessens the surface, and this was one of the reasons for dropping the third molar in the manufacture of artificial teeth. It is true that we do not have as much room in the mouth for making the bicuspids and molars as large and graceful as the natural teeth, but certainly it is necessary that we should have the cusps of these teeth properly and perfectly curved. If we stop for a moment and consider why a man's teeth are not made like a dog's, we can readily realize the wisdom of the Creator in forming them as he has. I think this is a strong argument in favor of the proper contouring of the teeth in making artificial dentures. We know that, with the character of the foods that we consume, if the conical form was followed there would be more pyorrhoea trouble than with the forms that nature has given us. How often do we see the cusps of the molars and bicuspids ground off in an artificial denture, thereby destroying entirely the work of the manufacturer, and we should regard this as sufficient reason for turning around and making the denture over again.

I want to say a word about the foods we consume, and also the effect of the saliva on the starchy foods. We know that converting starch into sugar is one of the functions of the saliva. This is especially true with thoroughly cooked starch, but it has very little effect upon raw starch. This is passed quickly into the stomach, and on into the small intestines, and it is there converted into glucose by the pancreatic juice, and taken up by the lacteals for the upbuilding of the tissues. I want to take exception to one statement the

essayist made, which I do not think he intended to make, that is; "That the saliva emulsifies starch." We all know that it is not an emulsion at all. It is a simple solution. The fats are emulsified, but sugar does not need any such process to get into the circulation.

As I said, the saliva has very little effect upon raw starch, but in thoroughly cooked potatoes, rice, wheat, etc., a large portion of it may be acted upon by the saliva, relieving the small intestines of a great deal of work. My distinguished old friend, Dr. Madden, of Nashville, has frequently remarked that he very much questioned the wisdom of consuming the breakfast foods—various forms of cereals so extensively advertised as being very digestible and beneficial. He says that it eliminates the necessity of mastication, which is nature's process of bringing the food in contact with the saliva, therefore, interfering with the action of the saliva in converting the starch into glucose. We can readily see the bad effects of this by the following illustration: When we swallow hastily a large bulk of oat meal, we have taken the stomach by surprise. The stomach has not had time to pour out the secretions to act upon the food. The process of mastication seems to have something to do with arousing the glands of the stomach to pour out their secretions. The sight and smell of food arouses the salivary glands to pour out their secretions, and we should give the stomach time to secrete its juice before we force upon it a large bulk of breakfast food. The foods we take should be very thoroughly cooked, and well masticated before swallowing.

Dr. L. P. Dotterer, Charleston, S. C.:—In connection with the making of artificial dentures, I want to say a word with regard to the artistic making of same: That is, that the teeth of an artificial set are all made the same shade. Now, we know that very few sets of natural teeth are all the same shade. I wish the manufacturers would make them so that we could get the incisors one shade, the canines a little darker, the bicuspids a little darker, and the molars a shade darker still. This would give the teeth the appearance of having been filled, and would make a much more artistic set of teeth.

Dr. Gray:—I appreciate very much the reading of the paper. I was especially interested in what Dr. Dotterer said. It strikes me that we are not paying the attention to the study of making artificial dentures that we should. We should pay more attention to the study of the surrounding parts than we have in the past. Let us combine

the idea of mastication with the æsthetic appearances of the surrounding parts. There is as much room for artistic work in this line as in operative work. There is as much need for the prosthetic man to understand the sizes, shades, angles of the teeth as it is for the operative man. If we are able to perfectly articulate the teeth to give the proper masticating surface, and make a thoroughly æsthetic job, conforming to the other features of the face, we have accomplished as much as the operative man. But, when we leave this to the advertising laboratory man, who has never seen the patient, we have not accomplished much. No man can properly construct a set of teeth unless he has studied the face and features of the patient. I believe we neglect this branch more from the fact that so many laboratories are springing up where they will make you a set of teeth for $3 or $4—satisfaction guaranteed. All you have to do is to send the impression and a biscuit bite, and he will do the rest—setting up the teeth and making the plate—never having seen the patient. It is impossible for a man to make a good artistic set of teeth without first studying the features of the patient, etc.

Dr. J. R. Beach:—I agree with the gentleman, who has just spoken, in regard to this branch of our work being very much neglected. In the construction of artificial dentures, we should study the characteristic features of the patient, note the temperament to which they belong, and select and set up the teeth accordingly.

On motion the subject was passed.

Dr. C. L. Alexander read the following letter to the Association from Dr. Frank Woodbury, of Halifax, Nova Scotia:

Dr. C. L. Alexander, Cor. Secty. S. B. N. D. A.
Charlotte, N. C.

My Dear Sir:—With the approach of the Annual Meeting of the Southern Branch of the National Dental Association, my heart inclines longingly toward Atlanta. The memory of my reception at St. Augustine, and the consideration and honor conferred, has made the profession in the Southland very near to me. Each year I have thought that I might be able to be with you, but the balmy climate did so much for me, that I have not needed to leave "The Lady of the Snows," as Kipling dubs Canada.

The Dental Profession in Canada is watching you across the

border with keen interest. We congratulate you upon your official entrance into the American Army. The advance step Georgia has taken in reference to dental attendance in your State Insane Hospitals greatly interests me. The British Army has Dentistry in the Imperial Service under serious consideration. It has been a long time coming, but we think now a faint streak of light meets our gaze. The South African campaign has brought the need to the front. In Canada our profession is progressing. All our Provinces have high standards of matriculation (about equal to matriculation in Arts) but there is thus far no reciprocity between provinces. The walls of legislation are high. There is a movement on foot now to give us a universal Dominion Standard of matriculation and registration. At least it is the entering wedge. Our provincial laws are, in the main, just, but, like your own State laws, bear hard on the men, who, though thoroughly equipped, cannot pass from one to another State on account of some "shibboleth" required.

We are aiming for a Dominion Association, which, by mutual consent of the Provinces, will have the power to appoint a board of examiners, whose certificate will give a man a Dominion registration. We propose that this shall be so high and thorough that it will compel the respect of Foreign Boards, and be one small factor in the great plan of professional progress that will command respect.

I apologize for claiming a minute of the time of your Convention. May your Convention be the very best yet held. To all who remember me, and to all, who made me so very welcome in '98, I want to say, as our Indians say: "I shake hands with you in my heart." May I look forward to the time when your National may be called International, and our prospective Canadian Association may be a Branch.

When the thermometer stands high in your country, we would welcome any and all of our brethren from the South to our delightful summer clime, where from June to October, our air is most salubrious.

Yours very sincerely,
FRANK WOODBURY.

On motion, Dr. Alexander was instructed to answer the letter from Dr. Woodbury, and extend to him the kindest regards of the Association.

Dr. Wm. Crenshaw, of Atlanta, read the following paper on

Non-Cohesive vs. Cohesive Gold for Cervical Margins.

During the thirty years of my practice in dentistry the question of gold preparation and its adaptation to tooth preservation has been one of special interest. Upon the discovery of the welding process of gold, our profession was wont to believe that the acme of perfection had been reached, and that through this process we had conquered finally the march of the microbe in tooth decay. But no greater disappointment has been realized within the time named.

The failure of cohesive gold at the cervical margin, to my mind, is inevitable, particularly if the margin be located in dentin or cementum.

The writer believes that in no small degree these failures are inaugurated at the time of making the filling if malleting is done. We say this because beneath the gold thus malleted down the cementum, which is composed of nervous tissue and lime salts, must reasonably have its structure crumbled or disintegrated. If this result obtains, it is only a question of time when the failure will become known.

These failures, the writer claims, are practically universal and come within the time the conditions prescribe, varying as these are favorable or otherwise.

In the light of the failures observed, the author has striven for years for perfect adaptation, by which he means perfect condensation of *noncohesive* gold at the cervical margin—believing that with this done the surest permanent preservation will have been secured if not ultimate perfection reached.

To do this a perfect adaptation of the matrix is a necessity. With this supplied, noncohesive gold becomes easy of adaptation and adjustment to the surface against which it must go; and becomes under these conditions practically a plastic filling material.

Fifteen years or so ago the writer read before this body—the Old Southern—a paper, the object of which was to point out that a system was possible only with cohesive gold. By this he meant everything that could be done with gold, could be done with cohesive gold. It was this point more than that cohesive gold was superior to the noncohesive as a tooth preserver he had in view.

In the course of the paper it was stated that a matrix was a snare and a deception. That opinion is still held of such matrices as were then extant—for they were then and are now a snare and deception.

After the reading of that paper and making a clinic with cohesive gold and electric mallet, when the subject came up for discussion, the elder Dr. Morgan, whose opinion was held by the writer in high esteem, said that such practice as was tthere illustrated entitled the patient to damages in the courts, and I don't know if he did not say the operator ought to go to jail.

Nine out of ten dentists then present scouted the idea of placing cohesive before noncohesive gold as a preserver of tooth structure, and the writer escaped from Nashville between two suns. But, with the matrix such as we now have, the contour of molars and bicuspids may be restored in a manner more perfect than has been possible heretofore, and with promise of greater protection against recurrent decay.

In using noncohesive gold at the cervical margins in conjunction with the matrix and cavity management now offered, we do away with retaining pits and their evils and dangers. We do away with malleting directly upon the margin of unstable structure. We place on the *margin* a preparation of gold, if not more compatible with its structure nature, one which by test in contact with dentin and cementum walls, has longer and more surely preserved them intact.

We do away with the task of building with cohesive gold, against which in the perfected matrix we have a form giving the outline of the contour in the shape of a mould, which limits to a grain the amount of material and at the same time so confines the gold that the adaptation is rendered easy and certain.

Noncohesive gold under these circumstances can be so perfectly condensed and settled in position that after being capped with the cohesive we have it placed so as to accomplish its greatest good, and the cohesive also where, with the wall boundary of enamel, it is at its best.

Therefore, to sum up: (1) We have a perfect marginal adaptation of the material employed; and this may be either gold, amalgam, cement, tin, or gutta percha, if the perfected matrix is used. (2) We abandon retaining pits. (3) We have the cavity simplified, so that we can place the material in rapidly and perfectly. (4) We have

cohesive gold where it serves best. (5) We get ample contour, the interdental space, and thus protect the gum festoon and maintain normal chewing surface. (6) We save material, save time, save the patient and his money, to ourselves. We save the operator, the patient and the country.

Discussion of Dr. Crenshaw's Paper.

Dr. G. V. I. Brown, Milwaukee:—I would like to occupy that peculiar position on this discussion of discussing both sides of the question. In the first place, I would like to say, with due regard to Dr. Crenshaw, that probably what Dr. Morgan said with regard to his operation was absolutely correct, because I believe one of the most injurious things we have had to deal with in the practice of operative dentistry is the use of the matrix in introducing fillings of any kind. The matrices we had 15 years ago were such as would not admit of the insertion of a perfect gold filling. I believe the profession owes much credit to such men as Dr. Crenshaw for their work in bringing dentistry to where it is at this time. If we are to learn it must be by such investigations as he is now making With the modern methods of operating and with the preparations of gold we now have it is possible to insert gold fillings anywhere in the mouth with or without the matrix, with comparatively no discomfort to the patient. The question of finishing is where the matrix cuts such a figure. The question is when you polish the filling can you do it without the destruction of the gum tissue and the bony septa around the tooth? The importance of this is not always considered. If you injure these tissues you have resulting the formation of scar tissue—without nerves and without blood-vessels—and something that will not produce the original condition. Where we use the matrix to aid us in these operations the question is will it aid us in finishing this filling so as not to injure these surrounding tissues, and its help in inserting the material? Everybody knows that non-cohesive gold is better adapted to these surfaces, but, as I look at it, it is a question of whether it will facilitate the polishing of that filling and the preservation of those living tissues in their natural condition.

Dr. J. O. Chapple, Atlanta, Ga.:—I do not want it to be imagined for a moment that my personal relationship to Dr. Crenshaw has in

any way influenced my judgment, but I wish to agree with him in all he claims for his matrix. It is not the result of a day's thought, but he has been working on this for a number of years. I wish particularly to emphasize so much of this paper as relates to the facility with which fillings can be introduced by the aid of his advice. In the clinic of yesterday, where he showed a number of fillings made several weeks ago, it was my privilege to see the beginning and finishing of each operation, and I take pleasure in corroborating every claim he has made for his matrix. He has convinced himself that he was wrong, and as a result, his hitherto large and extensive practice in cohesive gold work has been reversed.

I feel confident that if you will give this matrix a trial you will be delighted with it. I believe it will bring about a revolution in restorative gold work.

Dr. Hinman:—I would like to hear from Dr. Holland on this subject.

Dr. Frank Holland, Atlanta, Ga.:—I must admit that I have some views on this subject. The truth of the matter is, after an experience of about 19 or 20 years, I am prepared to refute the gentleman's proposition. I can prove it by bringing one of the profession before you this morning. I can demonstrate to you beyond any question that cohesive gold has preserved two teeth perfectly at the cervical margins for 20 years. I saw these teeth a short time ago and they were in perfect condition. It is the work of Dr. Morgan on Dr. Walker Brown of this city. I believe if I have done any good in my life it is due to the teachings of such men as Dr. Morgan and Dr. Webb. These fillings are perfect and were made with cohesive gold. They are in as perfect condition as they were the day he made them. Gentlemen, can you argue against such demonstration as that? I do not care to enter into the discussion further, but will say that it is not necessary to mallet with such force at the margin as will fracture the margins. You can adapt cohesive gold as perfectly to the margins of a cavity as noncohesive—more so, I believe.

Dr. H. W. Morgan:—I want to take exception to the assertion of the gentleman who has just spoken, that under certain conditions that "Noncohesive" gold will do better than "Cohesive" gold, under other conditions, that the "Cohesive" gold will do better than the "Noncohesive." I want to contend that gold does not preserve the

tooth structure at all. It is the change we bring about in the conditions of the tissues that preserve them. Filling material is adjusted at that point so as to reproduce the loss of tissues and produce conditions antagonistic to those which originally located the decay there. The gold does not preserve, but stops the process by its skilful adaption of the walls and the dentist by so arranging these walls that they will be kept clean, thereby producing conditions contrary to those originally brought about the caries. The primary location of the caries is the result of abnormal physical conditions or structure imperfections and when we have produced right conditions, by the insertion of fillings, we prevent the reoccurrence of the decay, and so preserve the teeth. My friend, Dr. Brown, sitting by me has two teeth filled with Gutta Percha 20 years ago, and to-day are in a state of preservation. Was it the Gutta Percha or was it the mechanical skill exerted in placing this material as to prevent the occurrence of decay? My contention is that a filling mechanically devised for the protection of the cavity and does not preserve the tooth structure, in the sense this expression is generally used. I have a filling in my mouth made by Dr. Marshall Webb, put there twenty years ago. It was made entirely of cohesive gold with an electric mallet, is a large contour in the distal surface of the second Bicuspid, and I challenge any man to find the least sign of reoccurrence of decay around it. It was not the gold, but Dr. Webb's skill that has preserved the tooth. I want to compliment Dr. Crenshaw on the instrument he has so generously offered the profession as a substitute for the old matrices. I want one of them as soon as they are on the market. I wish also to compliment Dr. Crenshaw for having the moral courage to come before this Association and take grounds against a practice he had been following for twenty years. Few men could do this with the grace he has done it. If the instrument will do all he claims of it; if it will enable us to place gold in these cavities, Bicuspids and Molars, with greater facility and accuracy, I say it is the thing we want. It must stand the test of time and prove its worthiness to be generally adopted by profession.

Dr. C. C. Alexander, Charlotte, N. C.:—I do not care to discuss the relative value of the different forms of gold soft and cohesive. I feel that I would have to abandon dentistry if I had to confine myself to just one form. I have never used a matrix. I have never

seen a place where I could use it to advantage, but since seeing this matrix of Dr. Crenshaw's and seeing such results from its use, I propose to give it a trial. I think we are due Dr. Crenshaw much credit for this valuable instrument which in my judgment is the best that I have ever seen offered the profession, and am sorry he did not perfect it before age had marked its progress by the snow white prints upon his noble head. As I would like to see him reap a full measure of reward from the invention.

Dr. G. V. I. Brown, Milwaukee:—Once in a while a man is born who can use cohesive gold better than non-cohesive, and I believe Dr. Holland is one of these men. As for myself, I cannot do it. The question is which is better in the majority of cases. When there is any doubt in your mind, place non-cohesive every time. Such men as Dr. Holland and Dr. Webb have demonstrated the fact that cohesive gold can be adapted in all cases if the highest degree of operative dentistry is reached. But how many such operators have we at the present time?

I would like to say one word with regard to the shock sometimes produced in the tissues as the result of malleting gold into a cavity. The question of shock is one that we do not take into consideration as we should. The surgeon looks upon a shock as something which precedes collapse. We very often, I believe, in the insertion of large gold fillings produce serious after effects from the shock to the nerve filiaments, and I believe that dentists are very often responsible for after effects for which we are not credited. I have inserted large cohesive gold fillings that I would not attempt to insert now with cohesive gold, as long as I could get a substitute that would enable me to avoid the danger of shock to the tissues. I think we should welcome the matrix or anything that will enable us to better preserve the tissues and lessen the liability to shock.

Dr. Wm. Crenshaw, Atlanta:—With regard to gold preserving the tooth structure, Dr. Morgan expressed my idea exactly when he said it was not a question of gold that we were discussing, but the question of adaptation. We can get better adaptation with soft gold when it is held firmly in position by the use of the matrix than we can with cohesive gold with or without matrix. Some 15 or 18 years ago, after the death of Dr. Webb, I spent three months with Dr. Parmely Brown, then the foremost who was advocate of co-

hesive gold and the electric mallet. I made these different preparations of gold and the manner of adapting them a study. I observed Dr. Brown closely to see how he manipulated cohesive gold with the electric mallet. I came home perfectly enthused over the results and I thought we had everything in a sling before us. I prepared myself for this work, and filled every tooth with cohesive gold that came. Opening the teeth with a separator and shaping the margins with care, malleting the gold in with the electric mallet. Eight or ten years ago I found in many cases the margins at the gingival borders were failing. I was greatly disappointed. On the other hand I saw fillings of soft gold that had been standing 20, 30 and 40 years, with the margins perfect, and no sign of recurrent decay. There is no man who has observed many of these fillings, but who will tell you that soft gold will preserve the tooth better than cohesive, when properly manipulated. I believe most of the failures are made in the laying of the foundations of the fillings; therefore I have changed my views with regard to cohesive gold, on account of having proved to myself by my own operations of its failure, and on account of seeing more successes made with soft gold than with cohesive. Dr. Holland cites Dr. Webb's operations performed in the mouth of Dr. Brown, of this city, as proof of the fact that cohesive gold can be relied upon. In answer to that I will say that those operations he speaks of are failures. I examined them and found recurrent decay where gold was placed by the best operator the profession has known. I have a filling in my mouth made by Dr. Parmely Brown with cohesive gold that is failing. And I believe it is universally true that all such filings made with cohesive gold will fail. Probably not in three, five or ten years, but they will fail. Dr. Morgan speaks of the margins of the fillings in his mouth. If these margins are beneath the gum there is likely recurrent decay there to-day. I believe the obstacles are overcome by the use of the matrix I offer. It represents my idea in working out the proposition.

Dr. Holland:—With reference to Dr. Webb's work, I did state that I had seen it recently, but since thinking about it, it was several months ago. I will ask the gentleman, though, if he has seen a soft gold filling that has lasted that long.

Dr. Crenshaw:—I have seen soft gold fillings that have lasted 40 years. If a cohesive or non-cohesive gold filling fails in 20

years it is a failure. Many of the cohesive gold fillings referred to as decaying are not extensively decayed at the cervical margins, but these are pits around them of recurrent decay. I have not spoken on any risk whatever, the pits are there, the recurrent decay is there, and you can see for yourselves. It is a matter of proof that you cannot rely upon cohesive gold at cervical margins. I think we should seek to find something better. I think with the matrix a safer and better class of work can be done at these margins with soft than with cohesive gold.

On motion the subject was passed and the Association proceeded to the election of officers for the next Convention. The following officers were elected:

President—Dr. L. G. Noel, Nashville, Tenn.

First Vice-President—Dr. Geo. S. Vann, Gadsden, Ala.

Second Vice-President—Dr. W. G. Mason, Tampa, Fla.

Third Vice-President—Dr. John R. Beach, Clarksville, Tenn.

Treasurer—Dr. B. D. Brabson, Knoxville, Tenn.

Corresponding Secretary—Dr. C. L. Alexander, Charlotte, N. C.

Recording Secretary—Dr. S. W. Foster, Atlanta, Ga.

Dr. J. A. Chapple, Atlanta, Ga., was elected Annual Essayist.

Drs. J. E. Chace, Ocala, Fla., and J. P. Gray, Nashville, Tenn., were elected members of the Executive Committee for three years, and Dr. W. H. Weaver, Lagrange, Ga., for ttwo years. V. E. Turner, Raleigh, N. C., Chairman, and H. R. Melindy, Knoxville, Tenn., were re-elected.

No further business on hand the Southern Branch of the National Dental Association adjourned to meet again at a time and place to be decided later.

Members of the Southern Branch of National Dental Association

who have paid dues for 1902, also names of charter members of the old Southern Dental Association, who are exempt from dues but are to receive the transactions, and will be marked thus *.

ADAIR, R. B.....Atlanta, Ga.
ALEXANDER. C. L.....Charlotte. N. C.
ALLEN. T. M.....Birmingham, Ala.
ANTHONY. L. P.....Atlanta, Ga.
*ARRINGTON. B. F.....Goldsboro, N. C.
*AUGSPATH. L.....Little Rock. Ark.
BEACH, H. E.....Clarksville. Tenn.
BEACH, JOHN R.....Clarksville. Tenn.
BEADLES, E. P.....Danville, Va.
BETTS, J. S.....Greensboro, N. C.
BENTON. I. H.....Newberne, N. C.
BILLMYER, U. D.....Chattanooga. Tenn.
BLAND. W. A.....Charlotte. N. C.
BLAND, CHAS. A.....Charlotte. N. C.
BOGLE. R. BOYD.....Nashville, Tenn.
BOOZER, J. E.....Columbia. S. C.
BOOZER. D. L.....Newberry, S. C.
BRONSON, B. D.....Knoxville. Tenn.
BROCKETT. C. T.....Atlanta, Ga.
*BOYD, H. D.....Troy, Ala.
*BROWN. J. P. H.....Augusta, Ga.
CARLISLE, JNO. P.....Greenville. S. C.
CASSIDY. J. S.....Covington, Ky.
CHACE. I. E.....Ocala, Fla.
CHAPPLE, J. A.....Atlanta, Ga.
CLIFTON. W. R.....Waco, Tex.
CORLEY. J. P.....Greensboro, Ala.
COMBS. J. W.....Newbraunfels. Tex.
CRAWFORD, J. Y.....Nashville. Tenn.
CRENSHAW, WM.....Atlanta, Ga.
CRENSHAW, THOS.....Atlanta, Ga.
CROSSLAND, J. H.....Montgomery, Ala.
CRUTCHER, R. D.....Lewisburg, Tenn.
COWARDIN, L. M.....Richmond, Va.
*CARPENTER, L. D.....Atlanta, Ga.
*COLE, W. T.....Newman, Ga.

*Cook, W. H.....Denton, Tex.
Dale, J. A.....Nashville, Tenn.
David, J. W.....Mexia, Tex.
Dickson, Southall .....Bolivar, Tenn.
Donnally, Wms.....Washington, D. C.
Duff, Sam G.....Greenville, Tex.
Dotterer, L. P.....Charleston, S. C.
Evans, Geo.....New York Citv.
Everitt, David E.....Raleigh, N. C.
Ewald, W. H.....Portsmouth, Va.
*Friedrichs, G. J.....New Orleans, La.
Fife, J. G.....Dallas, Tex.
Finley, M. F.....Washington, D. C.
Finney, W. B.....Baltimore, Md.
Fleming, J. M.....Raleigh, N. C.
Foster, S. W.....Atlanta, Ga.
Frink, C. H.....Fernandina, Fla.
Gorman, J. A.....Asheville, N. C.
Gray, J. P.....Nashville, Tenn.
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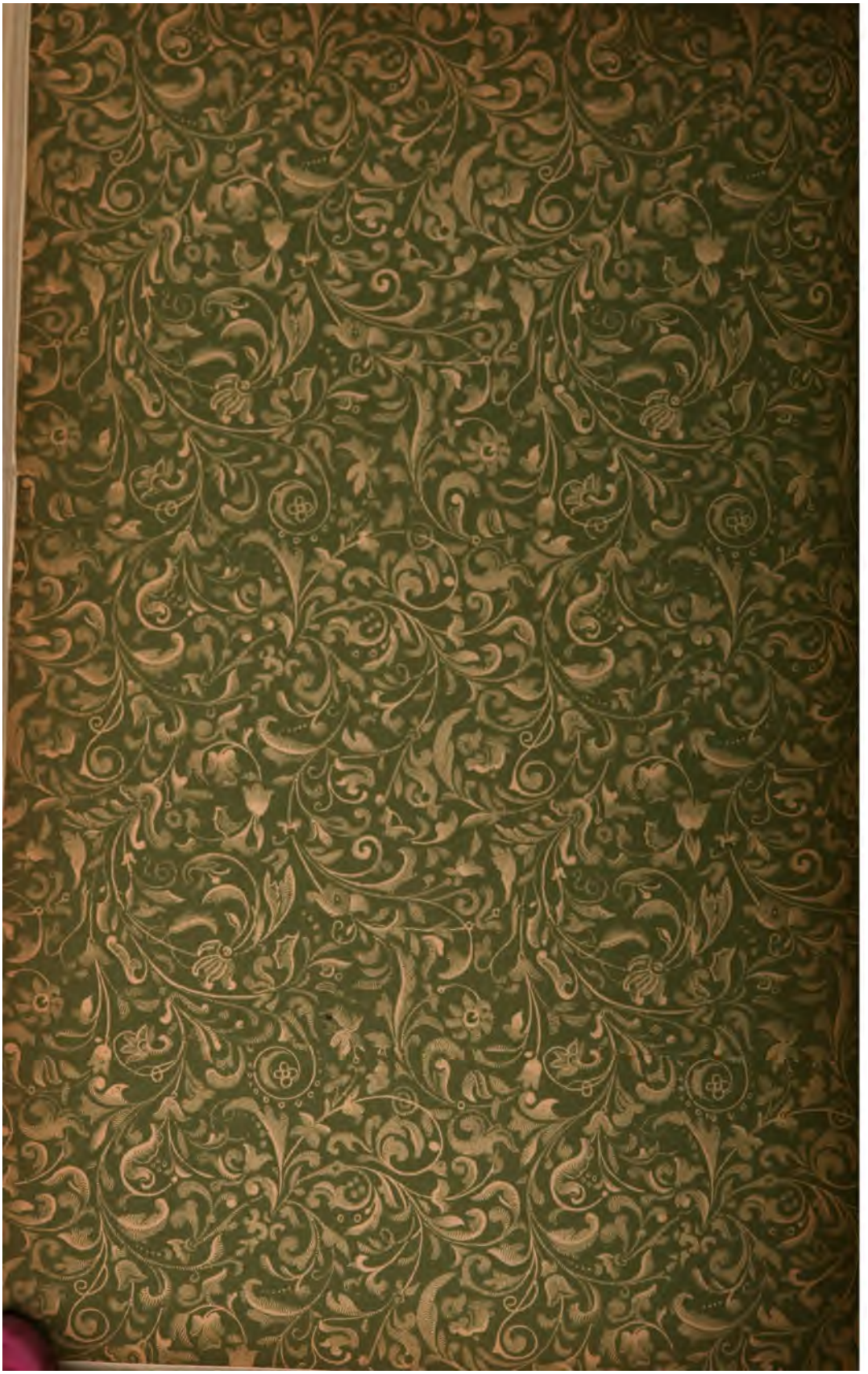

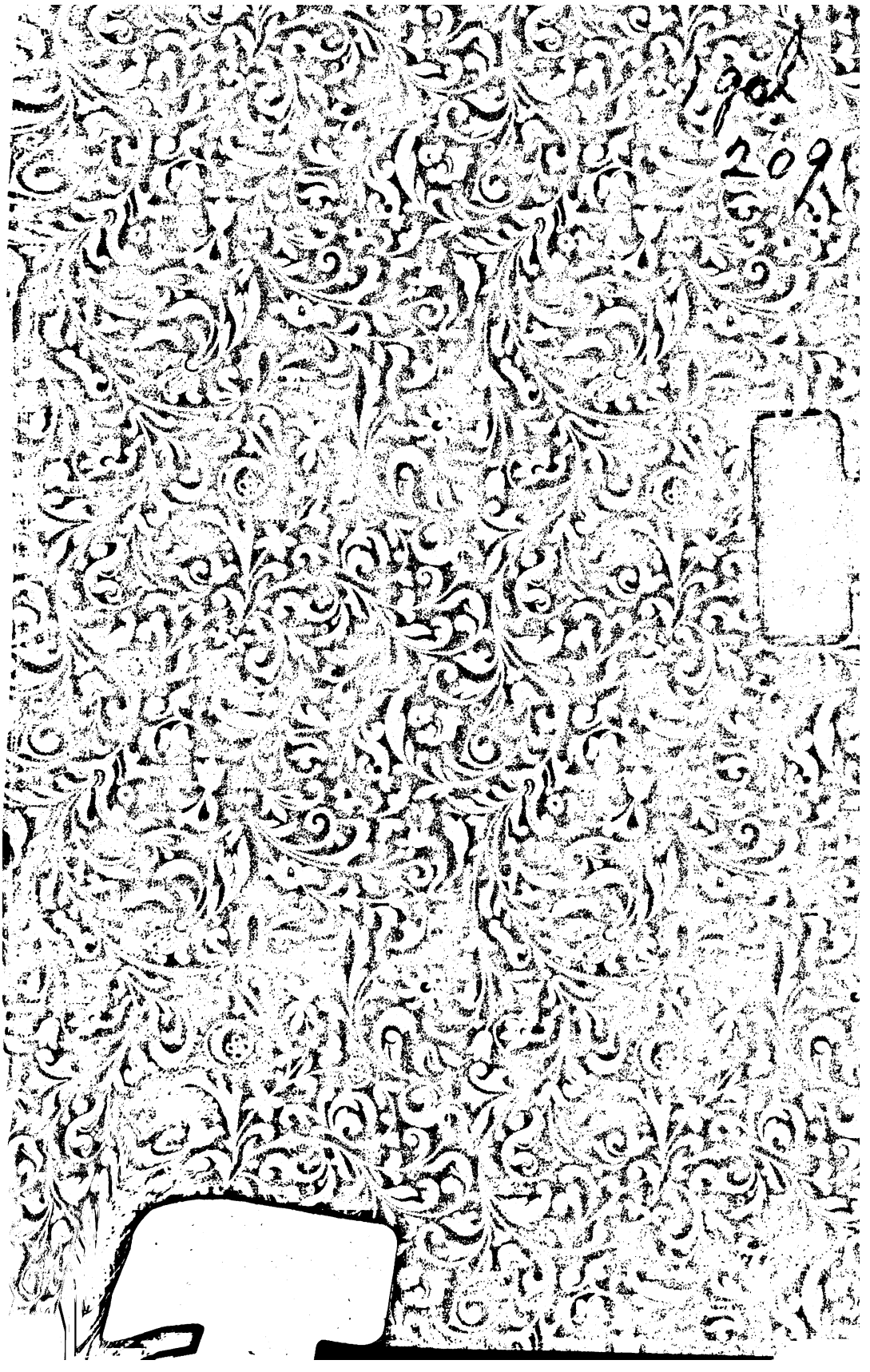

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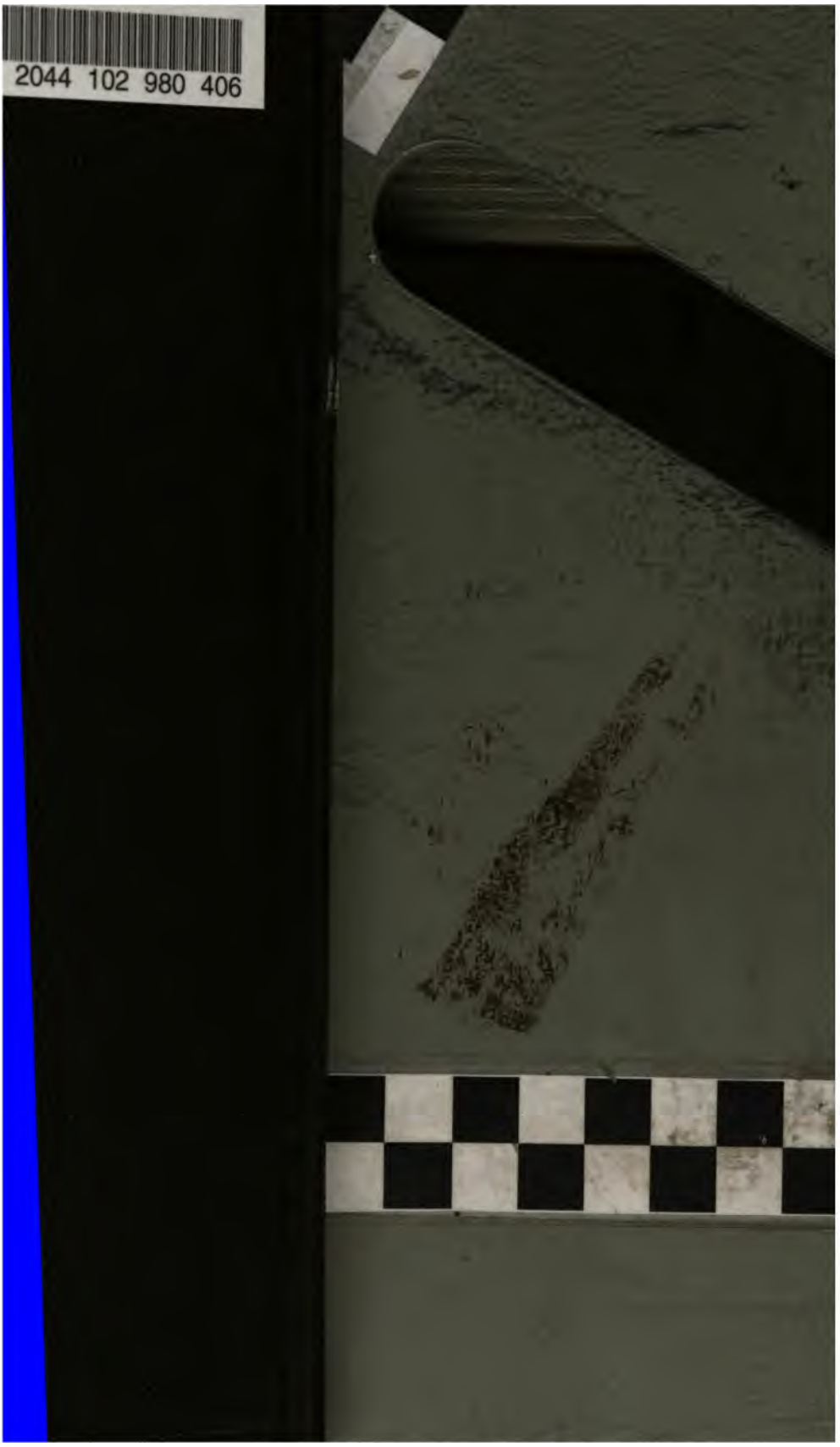
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